

DISSERTATION

A MULTISYSTEM, LONGITUDINAL STUDY OF RESILIENCE FACTORS AND
POSITIVE EDUCATIONAL OUTCOMES FOR MEXICAN YOUTH

Submitted by

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WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY LAURA CHAPIN ENTITLED A MULTISYSTEM, LONGITUDINAL STUDY OF RESILIENCE FACTORS AND POSITIVE EDUCATIONAL OUTCOMES FOR MEXICAN YOUTH BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE DOCTOR OF PHILOSOPHY.

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ABSTRACT OF DISSERTATION

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This study uses an ecodevelopmental framework to examine factors related to positive educational outcomes for Mexican adolescents. This framework allows exploration of a number of microsystem and mesosystem factors in middle adolescence to explain high school graduation and college graduation. Additional theoretical support for individual factors comes from the developmental assets framework. Data from the National Longitudinal Study of Adolescent Health (Add Health) was used to address two primary aims: 1) to determine if high school and college graduation of Mexicans vary as a function of gender and immigrant generation; 2) to determine if individual factors, the family and friend microsystems, and the family-friend mesosystem predict high school and college graduation. No differences in these educational outcomes were found by gender or immigrant generation. An individual's aspirations and expectations about college, parent-child relationship quality, expectations for high school/college graduation, and friends' GPAs were the important predictors of both outcomes and friends' substance use was also significant for college graduation.

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TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION.....	1
Focusing on Resilience, not Poor Outcomes.....	1
Statement of the Problem.....	4
Research Questions.....	10
Ecodevelopmental Framework.....	10
Developmental Assets.....	16
An Integrated Theoretical Framework for Current Study.....	20
Defining Positive Outcomes.....	22
Individual Factors.....	24
Microsystems.....	27
Mesosystems.....	32
Macrosystems.....	33
CHAPTER 2: METHOD.....	40
Study Design.....	40
Demographic Measures.....	42
Outcome Measures: Educational Attainment.....	44
Predictors: Individual Factors.....	44
Predictors: Family and Friend Microsystem Factors.....	46
Predictors: Family-Friend Mesosystem Factor.....	49
Analyses.....	50

CHAPTER 3: RESULTS.....	53
Descriptive Findings.....	53
Gender Differences in Educational Outcomes.....	53
Immigrant Generation Differences in Educational Outcomes.....	55
Predictors of High School Graduation.....	56
Predictors of College Graduation.....	63
Post Hoc Analyses.....	69
CHAPTER 4: DISCUSSION.....	72
Gender results.....	75
Immigrant generation results.....	77
Predicting high school and college graduation.....	77
Limitations.....	84
Implications of Findings.....	86
Future Directions.....	89
REFERENCES.....	92
APPENDICES.....	107

Figures

1. Conceptual model predicting educational outcomes for Mexican youth.....	21
2. Predicted Probability of High School and College Graduates by Gender.....	55
3. Predicted Probability of High School and College Graduates by Immigrant Generation.....	56
4. A leaky education pipeline.....	75

Tables

1. Developmental Assets.....	19
2. Hispanic ethnic groups in the US.....	34
3. Mexican Educational Attainment by Immigrant Generation.....	36
4. Study Variables' and Sample Descriptive Statistics.....	54
5. Bivariate Estimates between High School Graduation and Categorical Variables....	57
6. Bivariate Estimates between High School Graduation and Continuous Variable.....	58
7. Logistic Regressions Predicting High School Graduation.....	60
8. Final Hierarchical Logistic Regressions Predicting High School Graduation.....	62
9. Bivariate Estimates between College Graduation and Categorical Variables.....	64
10. Bivariate Estimates between College Graduation and Continuous Variables.....	65
11. Logistic Regressions Predicting College Graduation.....	66
12. Final Hierarchical Logistic Regressions Predicting College Graduation.....	68
13. Multiple Linear Regressions between College Beliefs and Other Predictors.....	70
14. Summary of Significant Regression Factors.....	78

Appendices

A. Percentage of Missing Cases by Variable.....	107
B. Correlations among Predictors.....	108

CHAPTER 1: INTRODUCTION

Latino young people¹ are faring poorly in American schools, therefore understanding the factors that contribute to educational success is essential. Many resilience factors associated with high school and college graduation have been identified for at-risk students and also for Latinos in the US. However, few studies of Latino youth have had a strong theoretical foundation (Rodriguez & Morrobel, 2004) and studies that have compared ethnic groups often failed to include appropriate cultural variables that properly explain group differences (Phinney & Landin, 1998). This study will use a comprehensive ecodevelopmental framework (Bronfenbrenner, 1979; Szapocznik & Coatsworth, 1999) to explore educational outcomes among Mexican youth living in the US. The model includes family, friends, and the relationship between these influences, as well as individual factors. To ensure that this study is culturally sensitive, the constructs and outcomes were selected to be relevant to Mexican adolescents and their families.

Focusing on Resilience, not Poor Outcomes

Though American youth face many challenges as they grow up, some researchers stress that we should view young people as assets of the community to be developed, rather than problems to be managed, and this perspective should guide our research (Lerner, Alberts, Jellicic, & Smith, 2006). They encourage an approach that views

¹ This study will use the label Latino or Mexican. When discussing others' work, the terms are consistent with what the authors used; some studies use panethnic categories (e.g., Latino or Hispanic), others are more specific (e.g., Mexican).

positive development as more than just the absence of troubled behaviors like drug use or risky sex—successful development goes beyond this absence. A longitudinal study examining positive and negative trajectories found there is not an inverse relationship between problem behavior and positive youth development (PYD); the relationship between individuals and developmental contexts is much more complex (Zimmerman, Phelps, & Lerner, 2008). A PYD approach allows communities to see young people for their potential contributions, not their potential nuisance, and encourages a focus on developing strengths, skills, and values (Lerner et al., 2006). The five Cs have been theorized to represent these qualities that allow a young person to flourish and make a meaningful contribution to society: competence, character, confidence, connection, and compassion.

Though many Mexican youth thrive and display PYD, clearly the under-education of Latinos, including Mexicans, in the US is a serious concern and much more work is needed to mitigate the problem. While various frameworks and approaches have been utilized, some have suggested that a resilience approach is favored over a deficit approach to understand the development of Latino children and adolescents (Rodriguez & Morrobel, 2004). There has been a longer tradition of studying negative outcomes of minorities and now there is a greater need to understand successful development and provide an additional tool for intervention and prevention (Meece & Kurtz-Costes, 2001; Rodriguez & Morrobel, 2004). Researchers typically define resilience as a process resulting in positive outcomes or adaptation for children or adolescents who have experienced adversity (Luthar, Cichetti, & Becker, 2000). Masten (2001) concluded that the resilience processes related to positive outcomes are not extraordinary:

Resilience appears to be a common phenomenon that results in most cases from the operation of basic human adaptational systems. If those systems are protected and in good working order, development is robust even in the face of severe adversity; if these systems are impaired, antecedent or consequent to adversity, then the risk for developmental problems is much greater, particularly if the environmental hazards are prolonged. (p. 227)

Moreover, Masten and many other researchers support a conceptualization of resilience as a *process*, not a state of being or personality trait. Therefore, resilience research should focus on understanding the processes that enable children with many risk factors to achieve specific positive outcomes.

More research about resilience of ethnic minority children and adolescents living in the US is necessary. Adaptive individual characteristics, family support and other relationships, do not necessarily operate in the same ways in all environments and may not have universal characteristics (Ungar, 2008). The majority of resilience research has focused on at-risk White children while most research about Latinos and African Americans is focused on problematic development, making it difficult to make conclusions about the resilience of minorities (McLoyd, 1998). Another reason for more research about minority children's resilience is that studies that focus on one ethnic group provide more information than research that compares ethnic groups (Meece & Kurtz-Costes, 2001). Studies that include different minority groups have often not been representative, generally sampling children from high-risk contexts; this is especially problematic when they compare these children to Whites from non-high-risk environments (McLoyd, 1998). Research about specific ethnic groups is very useful, however Rodriguez and Morrobel (2004) completed a recent review of youth developmental studies and found Latinos were not included in 70% of studies and results for Latinos were reported even less frequently (6%). They found that most of the studies

that did report findings for Latinos could be described as exploratory with no theoretical framework and were more focused on deficits than assets. They argued that a different approach is needed:

The focus on negative aspects of Latino youth development has been based on a relatively unchallenged assumption that there are barriers that must be overcome to achieve successful youth development... We present a challenge to youth development researchers, service providers, and policy makers to view successful youth development as our strongest tool for preempting the need for prevention and intervention programming by reorienting our attention toward assets rather than deficits. (pp. 108-109)

Meece and Kurtz-Costes (2001) similarly argued that a limitation of current research about the schooling of minority children is the “focus on negative outcomes while ignoring factors that lead minority youth to succeed academically” (p. 4). This study will contribute to this valuable, though understudied, line of research focusing on educational success of Mexican.

Statement of the Problem

While many advocate either preventing problem behaviors or promoting positive ones, there is evidence that there is a connection and “it is likely that decreasing risk and increasing protection is likely to affect both problem and positive outcomes” (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004, p. 101). Though the focus of this study is positive developmental outcomes, to enhance this perspective and to provide sufficient necessity for study, an understanding of the poor outcomes and risk factors across social domains is also important (Catalano, Hawkins, Berglund, Pollard, & Arthur, 2002).

These outcomes are reviewed in this section.

Dropping out. High school dropout is a serious concern in the United States. In a recent review of the literature, Levin (2005) summarized the state of current dropout

statistics and future expectations. Each day 2,805 American students drop out of high school. These students are more likely to come from minority groups, low-income families, have a first language other than English, be pregnant, or have a disability. Between 2000 and 2020 it is expected that the percentage of Americans with less than a high school diploma will rise, while the percentage of both high school graduates and those with college education will fall, making it the first time in American history when education levels drop.

There are a number of long-term individual consequences associated with dropping out of high school. High school dropouts are more likely than graduates to suffer from poor physical and mental health, engage in criminal activity, be incarcerated, and receive public assistance (Levin, 2005; Moretti, 2005; Muennig, 2005; Waldfogel, Garfinkel, & Kelly, 2005). The economic consequences have been particularly well quantified. Dropouts earn about \$12,000 each year, about half of the income earned by those whose highest education level is a high school diploma; in a lifetime, dropouts lose about \$260,000 in income (Rouse, 2005).

These costs extend beyond the individual, to society at large. High school dropouts from the class of 2007 will cost the nation an estimated \$300 billion in lost productivity, wages, and taxes over their lifetimes (Ream & Rumberger, 2008). Dropouts contribute about \$60,000 less in federal and state income taxes than high school graduates in their lifetimes (Rouse, 2005). It is estimated that the US would save \$7.9 to \$10.8 billion in TANF, Food Stamps, and housing assistance if all single mothers completed high school (Waldfogel et al., 2005). Moreover, the education of American children is closely linked to the economic productivity of the nation, and in recent years

the US has been surpassed by seven countries in the percentage of college-educated young adults (Bailey, 2005). Today's students "could be the future workforce that keeps America economically competitive and supports an aging population—or it could be an economic and civic disaster in the making" (Levin, 2005, p. 13).

Educational outcomes and Latino youth in the US. By 2010, the percentage of Hispanics in the US is projected to reach 15.5% and about 20% of young people between 10 and 20 will be Hispanic (US Census Bureau, 2007a; Rodriguez & Morrobel, 2004). Hispanics are the largest panethnic group—outnumbering African Americans—and in 2000 in the West 32% of all students were Hispanic (Schargel, 2004a). Due to the increasing Latino population and the value of education, it is important to understand more about Mexicans who graduate from high school and go on to also complete postsecondary education. Though this study is about resilience rather than risk, it is important to establish some background about educational risk factors and poor outcomes.

The factors associated with Latinos students' greater educational risk include demographics related to socioeconomic status and school factors. Latino youth and families as a population are more likely to have several risk factors associated with poor educational and other outcomes, including poverty and low SES; living in neighborhoods with crime, drugs, and gangs; discrimination; and undocumented immigration status (Bacallao & Smokowski, 2007; Rodriguez & Morrobel, 2004; Rumbaut, 2008; Sue & Constantine, 2003). Approximately a quarter of Hispanic children have no form of health insurance, and Hispanics are less likely to attend pre-school programs (Schargel, 2004b).

US Hispanic families have the lowest mean annual family income of all panethnic groups, which is about \$20,000 less than the average White family (Rumbaut, 2008).

Graduation rates are extremely low among Latino youth. However, it should be noted that the true graduation and dropout statistics of Latinos are difficult to obtain. Accurately calculating graduation and dropout statistics is a study itself and currently there are no standard statistics on American high school graduation and dropout (Barton, 2009). These statistics are complicated by different ways of determining who is a dropout (some formally dropout, some just stop attending, some change schools and are lost) and determining who graduates (percentage of ninth graders who finish in four years, or percentage of young adults with a degree, and whether those who earn a GED are included or excluded); and sometimes statistics include immigrants who never attended US schools as dropouts or non-graduates (Barton, 2009). Because of these issues, it should not be assumed that dropout and graduation statistics are the opposite—that is, as a result of these calculation inconsistencies, we cannot assume that all students who do not drop out graduate, or that students who do not graduate have dropped out of American schools.

Nonetheless, it is clear that the dropout problem is serious for Hispanics. By one estimate, one in three Hispanics in the US has dropped out of high school and the dropout rate for Hispanics is twice that of non-Hispanics (Tienda, 2005; Schargel, 2004a). The rates vary by nation of origin: About 40% of Mexicans and 25% of those from Central America are dropouts. The absolute number of dropouts has increased as the numbers of Hispanics has climbed due to immigration and high birth rates, from 347,000 to 529,000 between 1990 and 2000. About a third of the 2000 dropouts are immigrants, most of

whom either never attended school in the US or attended very little (Schargel, 2004a). Latinos have the second lowest rates of high school graduation, with 53% nationally earning a high school diploma, however in the Northeast the figure is only 35.6% (Swanson, 2004). In 2000, the Hispanic graduation rate was estimated to be at the same level of Whites in 1970, putting Hispanics three decades behind (Tienda, 2005).

Many risk factors for poor educational attainment among Latino youth are present in the school environment. Balfanz and Legeters (2004) found minorities were far more likely to attend high schools they categorized as having weak promoting power, a measure of how successful a school is at graduating students (it was rare for schools with mostly White students to have low promoting power). In their report, Balfanz and Legters called these schools “dropout factories.” They estimate that 40% of Latino students go to schools where most students do not graduate. More than half of Hispanic students attend schools with higher rates of free or reduced-price lunch and most attend schools in which minorities make up the majority of students. All of these factors are associated with having less experienced teachers (Schargel, 2004a). Many urban schools serving primarily minority students have problems with teacher shortages and turnover rates reaching 50 to 70 percent (Lopez, 2002). Urban high schools also have much lower funding per student compared to suburban schools and less Title I funding than elementary schools. Students in these urban schools are likely to be old for their grade level, not promoted to the next grade, have poor attendance, and high levels of course failure (Neild & Balfanz, 2006).

Besides dropout, Latinos also have the lowest college enrollment, high college attrition, as well as the lowest overall education levels; only 6% of Latino kindergarteners

are expected to eventually earn a college degree, compared to 30% of Whites (Bohon, Johnson, & Gorman, 2006). Among high school graduates, 35% of Latinos go on to college, compared to 46% of Whites. In 2000, 22% of 18-24-year-old Latinos were enrolled in college, compared to 31% of Blacks and 39% of Whites (Cordero-Guzman, 2005). Hispanic males compared to females also show lower college attendance and graduation (Rumbaut, 2008). Among those Latinos who do reach college, only a small number actually graduate (Tashakkori, Ochoa, & Kemper, 1999). According to census data, among Latinos ages 18 to 34, 31.5% of males and 29.7% of females have a high school diploma and only 7.8% of males and 10.2% of females 25 to 34 have a college degree (Rumbaut, 2008). More Mexicans reported having some college (16.4%) than a bachelor's degree (5.6%) (Chapa & De La Rosa, 2004).

Despite these troubling statistics, there are positive signs that the education of Latino students is improving in some areas. The number of Latinos in higher education has been increasing; for example, in 1990 Hispanics made up 8.1% of students at 2-year colleges and in 2000 they comprised 14.2%. Rates of poverty, a significant factor in school achievement, declined among Latino families by 8.2% between 1990 and 2002 (Chapa & De La Rosa, 2004). High SES Hispanics who completed high school were as likely to go to college as non-Hispanic Whites; in 1992, 92.9% of Hispanics in the top SES quartile were in college within two years of high school graduation compared to 91.2% of Whites in the same economic group (Gonzalez & De La Torre, 2002). In 2000, 6.1% of bachelor's degrees were earned by Latinos, which was 105% higher than the number of degrees Latinos earned in 1991 (Cordero-Guzman, 2005).

Research Questions

Educational outcomes have practical and cultural significance for Latinos, providing a strong need for studies that further the understanding of factors that contribute to high school graduation and college graduation. The research focused on positive outcomes for Latinos is limited and is often not guided by theory (Rodriguez & Morrobel, 2004). The purpose of this study is to fill this gap for Mexican students.

Two research questions will guide this study:

1. How does high school and college graduation of Mexicans vary as a function of gender and immigrant generation?
2. How do individual resiliency factors, family and friend microsystems, and the family-friend mesosystems predict high school and college graduation of Mexicans?

Ecodevelopmental Framework

Two theoretical frameworks were used to guide the current study. Dozens of exploratory studies have examined the relationship between risk and protective factors and both positive and negative outcomes among Latino youth. However, resilience is best researched when appropriate theoretical approaches are used to provide structure to the factors and to acknowledge their relationships among each other (Cameron, Ungar, & Liebenberg, 2007). The ecodevelopmental framework incorporates three essential features to structure risk and protective factors in a comprehensive model: social ecology, a developmental perspective, and the importance of social interactions (Szapocznik & Coatsworth, 1999).

Social ecology. The ecodevelopmental framework uses the nested systems described by Bronfenbrenner's (1979) social ecology of human development. The influences that affect an individual's development fall into several levels:

1. Microsystems are the most proximal contexts that influence children directly, with family, school, and friends receiving the most attention.
2. Mesosystems are the interactions between microsystems, for example the relationship between family and school.
3. Macrosystems are the social influences and structures, such as culture, ethnicity, and gender roles.

The social ecology model also includes exosystems, which are levels that are not directly in contact with the child but have an indirect influence (e.g., a parent's workplace). This study does not include this level, and therefore will not be explained in detail. The literature in this section reviews those findings specifically using the ecodevelopmental framework, some with Hispanic populations. The next section will review additional research about Latinos which uses other theories and research that has no specified theories.

Microsystems are the systems most intimately connected to the child and therefore are the first focus for understanding the development of outcomes. The most commonly considered microsystems include the family, peer group, and school. The relationship between the child and microsystem members is reciprocal and complexity increases as the child grows older. The family is often cited as the most important microsystem (Szapocznik & Coatsworth, 1999) and ecodevelopmental studies have shown the important empirical relationship between family factors and adolescent outcomes

(Coatsworth, Pantin, McBride, Briones, Kutines, & Szapocznik, 2000; Prado, Szapocznik, Maldonado-Molina, Schwartz, Pantin, 2008).

Specific family factors that have been identified as protective include communication, connectedness, role modeling, parental expectations, and monitoring (Perrino, Gonzalez-Soldevilla, Pantin, & Szapocznik, 2000). In a study using this framework, conflict and support in the family microsystem were the most significant predictors of problem behaviors, though peer and school microsystems were also important (Coatsworth et al., 2000).

Research related to this framework also indicates the strong influence of friends on problem behaviors, particularly friend support and friends' involvement in risk behavior (Coatsworth, Pantin, Szapocznik, 2002; Perrino et al., 2000). For immigrant adolescents, peers are a source of socialization to majority culture values and behaviors (Pantin, Schwartz, Sullivan, Coatsworth, & Szapocznik, 2003). In one study, support in the peer microsystem was negatively associated with internalizing and externalizing symptoms and peer conflict were related to more internalizing behavior (Coatsworth et al., 2000). Later in the literature review additional research relating family and friend factors to educational outcomes will show additional support for these microsystem influences.

Mesosystems are the quality and strength of the relationships between microsystems. While mesosystems have received less attention, their influence on the individual is also important. Better-connected microsystems have a protective function for the child, contributing to more positive development (Coatsworth et al., 2000). Mesosystems should not be confused with cross-domain influences, which are indirect

influences and not characterized by direct contact between microsystems (Szapocznik & Coatsworth, 1999). For example, Szapocznik and Coatsworth concluded parenting style influenced children's behavior with friends (two different microsystems), but this was cross-domain because this aspect of the family microsystem was only indirectly associated with friends. Mesosystems are strictly understood as direct connections between microsystems, like how well parents know their children's friends.

For the family-peer mesosystem, an assumption is that parents are personally acquainted with the child's friends, are involved in their activities with friends, and might provide guidance about friendships (Szapocznik & Coatsworth, 1999). Despite the strength of the peer microsystem alone, family still has an important influence on friends (Perrino et al., 2000). Family also has an influence on the types of peers young people choose as friends (Coatsworth et al., 2000). Measures of support and conflict in the parent-school and parent-peer mesosystems significantly predicted problem behavior beyond the influence of microsystems (Coatsworth et al., 2000), demonstrating the unique and salient role of the mesosystem factors. The links between family and friends have demonstrated strong protection against drug use and antisocial behavior (Szapocznik & Coatsworth, 1999).

Macrosystems include the cultural and ideological context that influences the child, gender roles, the microsystems, and the mesosystems. Latino cultures tend to affect the family microsystem (e.g., typical cultural parenting practices), while American majority culture has more influence on the peer microsystem through acculturation (Coatsworth et al., 2000). These cultural contexts also have an important impact on the quality of the microsystems and mesosystems; the cultural experiences children have at

home shape their experiences in school and influence achievement (Monkman, Ronald, & Theramene, 2005). Policies, laws, and social programs for immigrants and low SES Latino families also can enhance or thwart development (Coatsworth et al., 2000; Prado et al., 2008).

Acculturation is a variable associated with culture that can be included in the macrosystem level. If there is a gap in acculturation between child and parent, this contributes to conflict (Perrino et al., 2000). Coatsworth and colleagues (2000) found Hispanic parents' acculturation interacted with family conflict, such that the relationship between family conflict and problem behaviors was stronger for families who had been in the US longer. They also found that more support in the family-school mesosystem was related to fewer problems and this was stronger for newer immigrant families.

Differential acculturation between Hispanic parents and children might affect the family-peer mesosystem if parents do not provide adequate monitoring of friends. For Mexican families, monitoring of children and adolescents is traditionally a community effort, and immigrant families might not be aware of the American expectation that parents should monitor their own children only; this might mean that youth are not adequately monitored (Coatsworth et al., 2002). Cultural beliefs about gender might also impact monitoring.

Mexican girls reported more parental monitoring than boys, which researchers speculated was related to traditional beliefs that girls are more vulnerable and require more supervision (Cota-Robles & Gamble, 2006). In addition, Hispanic parents might also encounter difficulties understanding American schools (Prado et al., 2008).

Developmental perspective. The second defining feature of the ecodevelopmental framework is a developmental focus, which is important to

understanding the process and how risk and protective factors impact outcomes.

Szapocznik and Coatsworth (1999) explain that measuring factors at a single point in time at different levels of the system offers a limited view of development, as well as a possibly misleading conception that the systems develop independently. Even a close examination of one outcome and identifying various predictors is limiting because this approach fails to account for changes in the child's growth and environment, or how factors influence each other. For example, some researchers have separately focused on distinct factors related to drug abuse, including aggression, poor academic achievement, and impulsivity. By looking at these factors separately, it is difficult to see how the factors might all be included on the same developmental trajectory.

Szapocznik and Coatsworth (1999) favor a more comprehensive idea of development, which they explain as "the complex set of features that emerge over time within the child and in the child's social ecosystems and the nature of the interactions within and among these systems as they change and influence each other reciprocally over time" (p. 342). Risk and protective factors change through development slowly or quickly. Although, if a child's whole social ecology organization is cumulatively risky at one point in time, it is more likely to be risky in the future and to lead to poor outcomes. School outcomes, specifically, should be examined with a developmental perspective because the cumulative experiences and contexts of children are important to educational outcomes (Meece & Kurtz-Costes, 2001).

Social interactions. The mechanisms of risk and protection in the ecodevelopmental framework are social interactions, the third aspect of the ecodevelopmental framework. This focus is "consistent with a holistic view of

development in which individual functioning and development are proposed to be a reciprocal process of continuous interaction between person and environment” (Szapocznik & Coatsworth, 1999, p. 345). The interactions are between the individual child and the members of the social ecology system levels.

The ecodevelopmental framework allows for the assessment of the complex factors associated with Latinos’ educational outcomes. One important advantage of this theory is the developmental focus and ability to think longitudinally, but a limitation of this theory is that it does not include individual factors. However, one study indicated that Hispanic adolescents with high ecodevelopmental risk did not always have high intrapersonal risk, indicating there were different risk subgroups and both types of risk should be considered (Prado, Schwartz, Maldonado-Molina, Huang, Pantin, Lopez, et al., 2009). Another study found self-concept partially mediated the relationship between peers and depressive symptoms and between school bonding and depression (Schwartz, Coatsworth, Pantin, Prado, Sharp, & Szapocznik, 2006). Another limitation is that previous work utilizing this framework was focused on negative outcomes rather than resilience, which will be the focus of the next theory.

Developmental Assets

In order to better study resilience, this study will also include individual factors which are absent from the ecodevelopmental framework. Individuals and contextual factors have a bidirectional relationship (Ungar & Lerner, 2008). This relationship is complex and allows for relative plasticity in development (Lerner, 2004). Individual factors, personal relationships, and outcomes, as well, are inexorably connected:

Outcomes associated with resilience, and the processes which mitigate risk and contribute to well-being, are therefore dependent upon individual, relational,

community, cultural, and contextual factors. These factors themselves contribute to perceptions of what is and is not healthy functioning among a particular at-risk population. (Ungar, Brown, Liebenberg, Othman, Kwong, Armstrong, & Gilgun, 2007, p. 307)

Though there is statistical and theoretical support for dividing individual and ecological factors into separate classes, “it is the fusion, or integration, of internal and external setting conditions that promotes positive development” (Theokas, Almerigi, Lerner, Dowling, Benson, Scales, et al., 2005, p. 137).

Typically, the study of resilience and positive development have been separate, though there is much overlap and integration would benefit both lines of research (Edwards, Mumford, & Serra-Roldan, 2007; Ungar & Lerner, 2008). Developmental assets theory was established by researchers at the Search Institute and is focused on those skills, relationships, values, and experiences that are related to the healthy development of youth—with less emphasis on the absence of problems (Scales, Benson, Roehlkepartain, Sesma, & van Dulmen, 2006). Based on this theory, there are 40 assets divided into external and internal assets, each with four categories (see Table 1). The 40 assets were carefully selected based on hundreds of empirical studies of prevention, protection, and resilience (Leffert, Benson, Scales, Sharma, Drake, & Blyth, 1998) and to date, the Search Institute has collected data from about 148,000 students in grades 6 through 12 using the most recent version of their instrument to measure these assets (Search Institute, 2009). There were three criteria used to identify assets: reduce risk behavior, increase positive behavior, and/or promote resilience in the context of adversity (Benson, 2003). The assets have a greater emphasis on positive development than the absence of problematic behavior.

The developmental assets have been used in both research and community settings, and findings are generally consistent across ethnicities, SES, family backgrounds, and geographies, and for young people with few risk factors as well as those who have experienced adversity (Benson, 2003; Benson, Scales, Hamilton, & Sesma, 2006). There were no significant ethnic differences in the variance of overall indicators of thriving explained by the assets and the strongest assets were consistent across ethnic groups (Scales, Benson, Leffert, & Blyth, 2000). Both individual and ecological assets were more predictive of thriving than demographic measures, including SES, age, and gender (Theokas et al., 2005). For Hispanics, the assets that were most significant in predicting thriving were family support, responsibility, interpersonal competence, and caring community or neighborhood (Scales et al., 2000). However, overall there were more similarities among ethnic groups than differences.

Evidence shows that having more developmental assets is related to doing well in school, school attendance, GPA, other positive behaviors, and fewer risk behaviors, with some assets as stronger predictors (Scales et al., 2006). A greater number of assets was related to individuals having more positive outcomes, including thriving indicators like appreciating diversity, sustaining good health, helping others, delay of gratification, coping, dealing with adversity, and leadership (Mannes, Roehlkepartain, & Benson, 2005; Scales, Leffert, & Vraa, 2003). Benson (2003) found that assets had a cumulative effect, such that adolescents with more assets had greater academic achievement, better grades, and participated in more prosocial activities. Additionally, adolescents who had more assets were more likely to have positive outcomes measured in young adulthood. An increase in the number of assets is also related to lower levels of problem behaviors

Table 1

Developmental Assets

Internal assets		External assets	
Commitment to learning	Positive values	Support	Boundaries & expectations
1. Achievement motivation	11. Caring	21. Family support	31. Family boundaries
2. School engagement	12. Equality & social justice	22. Positive family communication	32. School boundaries
3. Homework	13. Integrity	23. Other adult relationship	33. Neighborhood boundaries
4. Bonding to school	14. Honesty	24. Caring neighborhood	34. Adult role models
5. Reading for pleasure	15. Responsibility	25. Caring school climate	35. Positive peer influence
	16. Restraint	26. Parent involvement in school	36. High expectations
Social competencies			
6. Planning & decision making	Positive identity	Empowerment	Constructive use of time
7. Interpersonal competence	17. Personal power	27. Community values youth	37. Creative activities
8. Cultural competence	18. Self-esteem	28. Youth as resources	38. Youth programs
9. Resistance skills	19. Sense of purpose	29. Service to others	39. Religious community
10. Peaceful conflict resolution	20. Positive view of personal future	30. Safety	40. Time at home

Note. Adapted from “Developmental assets: Measurement and prediction of risk behaviors among adolescent” by N. Leffert, P. L. Benson, P. C. Scales, A. R. Sharma, D. R. Drake, & D. A. Blyth, 1998, *Applied Developmental Science*, 2(4), 209-230. Copyright 1998 by Psychology Press.

like school failure, substance use, and violence (Benson, 2003). Assets that would be considered individual (e.g., values and positive identity) had a stronger relationship than ecological assets (e.g., family connection and school connection) with indicators of thriving, perhaps because these measures are more proximal to these outcome measures (Theokas et al., 2005).

Findings that a greater number of assets were related to better school performance are important for the current study. Students who are identified as at-risk might be better served by an asset framework than by a deficit model (Edwards, Mumford, Shillingford, & Serra-Roldan, 2007). Developmental assets can have a powerful, positive influence on school performance and prevention of school failure (Edwards, et al., 2007). Adolescents who had 31-40 assets said they got mostly As twice as often as young people who had 11-20 assets, and compared to those with 0-10 assets, they were eight times more likely to get As (Benson, 2003). Achievement motivation and school engagement were two assets significantly related to school grades for all ethnic groups (Scales et al., 2000). Additional assets that were significant for Hispanics were time in youth programs, time at home, and personal power. Young people with more assets were more likely to have good grades (Scales et al., 2000).

A number of studies have looked at the relationship between developmental assets and the five Cs, which measure thriving or positive youth development (PYD). Theokas and Lerner (2006) explored the structure of assets and the impact on PYD, finding a unique and strong relationship between assets and thriving. In another study utilizing similar indicators of positive development, there were few racial or gender differences in their relationships with outcome measures (Scales, Benson, Moore, Lippman, Brown, & Zaff, 2008).

An Integrated Theoretical Framework for Current Study

The following literature review specifically investigates factors related to high school and college graduation of Latinos (and Mexicans when possible), and does not generally discuss school outcomes for non-Latinos or at-risk students. The measures used

in this study have been selected to best reflect the constructs that have been suggested by previous research as relevant for Mexicans. This study incorporated aspects of the developmental assets with the ecodevelopmental framework to understand the resilience process of Mexican adolescents. The two frameworks both stress the importance of relationships. Several of the internal developmental assets were included in this study: planning and decision making, self-esteem, positive view of personal future, and personal power (see Table 1). Resilience is characterized by both individual factors and relational factors: “Resilience is both an individual’s capacity to navigate to healthy resources and a condition of the individual’s family, community, and culture to provide these resources in culturally meaningful ways” (Ungar, 2006, p. 55).

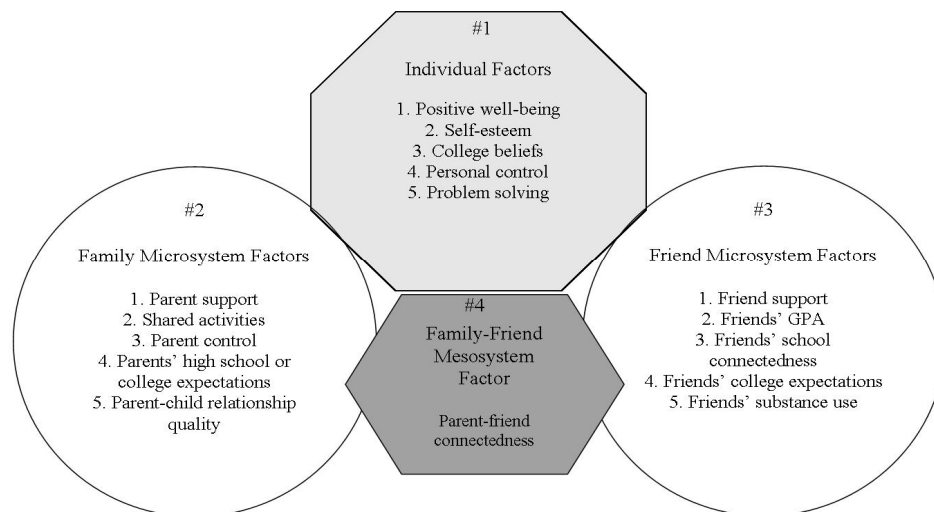


Figure 1. Conceptual model predicting educational outcomes for Mexican youth.

The following sections will discuss the definition of positive outcomes and summarize the research related to individual, microsystem, and mesosystem factors associated with educational outcomes for Latinos and Mexicans in the United States that were considered in this study. My conceptual model is largely influenced by

ecodevelopmental theory. The following sections will refer to the numbered bubbles in Figure 1.

Defining Positive Outcomes

Positive outcomes have been inconsistently operationalized by resilience researchers (Luthar et al., 2000; Masten, 2001). Definitions of success used by researchers, schools, and others are generally based on middle-class and White adolescents, and the same definitions might not be appropriate for adolescents from other ethnic groups, immigrants, and/or those growing up in environments facing many risk factors (Arrington & Wilson, 2000; Sue & Constantine, 2003; Yang, MacPhee, Fetsch, & Wahler, 2000). Ungar (2006) stresses we cannot use the same standards of positive development for young people in all cultural contexts. Therefore, the operationalization of measures used in this study carefully considered the literature related to Latinos and education. Though educational outcomes might seem obvious, it is still important to define positive outcomes that are consistent with Latino cultural values and practices (Arrington & Wilson, 2000).

High school graduation and postsecondary education were chosen as the outcomes for this study, which are appropriate outcome measures for resilience research (Masten & Coatsworth, 1998). Long-term educational outcomes (rather than grades) were also selected because education is an important value for Latinos, both young people (Suárez -Orozco & Todorova, 2006) and parents:

In short, educational success is a means by which Mexican immigrant parents' dreams for their children can be fulfilled, even if their own personal social status does not improve and even if the eventual social advantages accrued by their children take a lifetime to emerge. (Crosnoe, 2006, p. 3)

Many Mexican immigrants associate education with moving up in life and improving their opportunities to provide for themselves and their families (Parra-Cardona, Bullock, Imig, Villarruel, & Gold, 2006). In the past, some community members and educators interpreted a lack of parent involvement as meaning parents' did not value education; however, this myth has been discredited. Minority parents generally highly value education, want their children to be good students, and will work with teachers when asked (Auerbach, 2007). Mexican parents in the US tend to believe that a good education is essential for good jobs, a successful future for their children, and doing well in school means children are on the "good path of life" (Cooper, Brown, Azmitia, & Chavira, 2005; Okagaki & Frensch, 1998).

Education is also an important value for Latino adolescents. In one study, 71.7% of Mexican high school seniors reported they had educational life goals, which was not statistically different from five other ethnic groups (Chang, Chen, Greenberger, Dooley, & Heckhausen, 2006). A study of Mexican immigrant adolescents found that they believed school achievement was the route to a better life and equated academic achievement with helping the family, not individual accomplishment (Suárez-Orozco & Suárez-Orozco, 1995). Understanding positive outcomes and educational attainment of Latinos is maximized when cultural, social, and psychological variables are all considered (Caldwell & Siwatu, 2003). The meanings of education outlined here indicate that long-term educational outcomes like high school and college graduation are important for Latinos.

Individual Factors

Individual factors (Figure 1, #1) are essential to understanding the resilience process (Masten & Coatsworth, 1998; Smokowski, Reynolds, & Bezruczko, 1999; Ungar, 2006, 2008). Ecodevelopmental factors alone do not necessarily provide a complete picture of risk or resilience, therefore including individual factors contributes to a more complete model (Luthar, 2006; McLoyd, 1998; Prado et al., 2009; Riley & Masten, 2005). “Ecological processes affect adolescent outcomes, at least in part, through their effects on intrapersonal processes” and further empirical work is needed to understand this relationship (Schwartz, Pantin, Coatsworth, & Szaocznik, 2007, p. 124)

Like outcomes, the factors used to understand the resilience process must also be culturally appropriate for Latino families (Ungar et al., 2007; Ungar 2008). By beginning with these individual measures, it will be clearer how personal relationships (microsystems) and other environmental factors affect the individual factors and outcomes. Individual variables were inspired by the developmental assets and include: positive well-being and self-esteem; college beliefs (expectations and aspirations); problem-solving; and personal control.

Positive well-being and self-esteem. Self-esteem has been identified as an important protective factor in many theories and studies of resilience associated with various outcomes (Luthar, 2006; Masten, 2001; Smith, Lizotte, Thornberry, & Krohn, 1995). The relationship between self-esteem and educational outcomes has been explored in different ways with mixed findings. As a developmental asset, self-esteem was an important predictor of school success (Scales et al., 2000). Wang, Kick, Fraser, and Burns (1998) found high school students’ self-esteem predicted years of schooling

measured at age 32. There was a weak relationship between self-esteem and educational attainment seven years later, though ethnic group differences were not explored (Marsh & O'Mara, 2008). In another longitudinal study, self-esteem was not a significant predictor of Latinos' postsecondary educational attainment (Sciarra & Whitson, 2007). However, because of the importance of self in resilience and developmental assets theories (Ungar et al., 2007), these factors will be included.

Problem-solving and personal control (hard work leads to accomplishment).

A similar concept, self-efficacy, is considered one of the constructs associated with positive youth development (Catalano et al., 2004). Students who are more successful believe that hard work and effort contribute to their academic success (Masten & Coatsworth, 1998). Internal locus of control was identified as a predictor of years of schooling measured many years later (Wang, et al., 1998). The developmental asset personal power was related to higher school grades (Scales et al., 2000). In a longitudinal study of Latino postsecondary educational attainment, internal locus of control was the strongest predictor of earning a bachelor's degree, an associate's degree, and a certificate or license (Sciarra & Whitson, 2007).

Auerbach (2007) found that Latino parents believed hard work was essential for their children to achieve in school. Parents used the schema *estudios*, the belief that hard work and persistence put you on the road to success, to describe their own experiences as immigrants as well as their beliefs about their children's education. In another study about cultural values, an important theme discussed by Mexican migrants was *trabajando duro*, meaning "working hard" (Parra-Cardona, et al., 2006). In interviews in another

study, many Latino parents said hard work and studying were important for education (Garcia-Reid, Reid, & Peterson, 2005).

Problem-solving skills and agency might also be two important intrapersonal factors contributing to positive outcomes, yet need to be explored in relation to ecological factors (Schwartz et al., 2007). Edwards and Lopez (2006) found that an important theme in life satisfaction for Mexican adolescents was the importance of a positive attitude toward life and problems. Problem-solving was also related to having higher college aspirations for Latinos (Waxman, Padron, & Garcia, 2007).

College beliefs: Expectations and aspirations. Having a positive view of the future is considered one aspect of positive youth development (Catalano et al., 2004). College aspirations denote the extent to which students desire to go to college, while expectations indicate their more realistic assessment of whether or not they will actually go to college. In an analysis of the National Educational Longitudinal Study data, Hispanics reported the lowest perceptions that they would graduate from high school and the lowest chances they would go to college (Tashakkori et al., 1999). Research with Latinos demonstrates that expectations do not always match aspirations. Latino ninth graders in one study had higher hopes of educational achievement compared to the schooling they expected they actually would achieve (Yowell, 2002). In another study of Latino adolescents, 16% expected to only graduate from high school; 21% expected to complete some college, 24% expected a 2-year degree, and 23% expected to graduate from college; only 5% expected to complete a master's or doctoral degree. However aspirations were higher: 31% aspired to a doctoral degree, 14% a master's degree, 20% a college degree (Ibanez, Kuiperminc, Jurkovic, & Perilla, 2004). It is noteworthy that in a

three-generation study of Latino women, it appears educational and career aspirations and expectations increase with each generation (Hernandez, Vargas-Lew, & Martinez, 1994).

There is a relationship between aspiration and expectations with educational measures. In a national study, high educational aspirations mediated the relationship between neighborhood disadvantage and high school completion (South, Baumer, & Lutz, 2003). Expectations to go to college also predicted school attachment and GPA (Caldwell, Wiebe, & Cleveland, 2006). Latino students who scored above the 75th percentile on standardized tests of problem-solving and who received mostly As and Bs in math had significantly higher college aspirations and higher high school expectations compared to students below the 25th percentile and with low math grades (Waxman et al., 2007). Educational expectations of Latino students were correlated with parental involvement (Ibanez et al., 2004; Kuperminc, Darnell, & Alvarez-Jimenez, 2008).

Aspirations and expectations vary among Latinos in the US originating from different countries. Mexican and Puerto Rican students had lower aspirations and expectations compared to non-Latinos, while Cubans aspirations were higher. For all groups aspirations were greater than expectations (Bohon et al., 2006). There might also be different educational expectations for daughters and sons from Latino immigrant families (Calderon, 1998).

Microsystems

Relationships are the main focus of the ecodevelopmental theory. Healthy and supportive relationships during adolescence are a key predictor of positive outcomes throughout adolescence and into young adulthood, and this study expects to find family and friends have an important influence on outcomes.

An ecological model that includes many contexts and factors has been used in several studies of Latino young people, and this model resulted in more culturally sensitive findings (e.g., Coatsworth et al., 2002; Hurtado-Ortiz & Gauvin, 2007; Marsiglia, Miles, Dustman, & Sills, 2002). Coatsworth and colleagues (2000) found strong support for their hypothesis that microsystems would predict outcomes in a study of Latino girls' externalizing and internalizing behaviors. Latino students also affirm that friends and family are important for success, and programs that build on these networks have successfully improved high school graduation and college attendance (Cooper, Chavira, & Mena, 2005; Edwards & Lopez, 2006; Way, 2004). This evidence suggests that the ecodevelopmental approach is an appropriate framework for examining Latino adolescents and their educational outcomes.

Family. The family microsystem (Figure 1, #2) is the most influential context for youth development (Coatsworth et al., 2000; Luthar, 2006; Perrino et al., 2000; Szapocznik & Coatsworth, 1999). More specifically, parental acceptance and firmness are important support factors for educational success (Steinberg, 1996). For low-income, academically-able students, parent support might be the most important factor in whether the child completes high school or drops out (Englund, Egeland, & Collins, 2008). Commitment to helping family members is an important cultural value for Latino adolescents and affects decision-making and goals (Parra-Cardona et al., 2006). *Familismo* encompasses "the importance of extended family ties in Latino culture as well as the strong identification and attachment of individuals with their families" and it is an important source of support for Mexican-American adolescents and predicted life satisfaction (Edwards & Lopez, 2006, p. 280).

Parent support predicted whether Latino students earned an associate's or bachelor's degree and parent support was also related to school engagement (Garcia-Reid et al., 2005; Sciarra & Whitson, 2007). Latino students who were having the most success in school had parents who balanced child agency and monitoring; the young people were allowed to make choices, but parents were also involved. Those Latino students whose parents provided little structure or were very controlling were less successful in school (Reese, Kroesen, & Gallimore, 2000). Students who reported their parents wanted them to get a college degree had higher college attendance (Hurtado-Ortiz & Gauvin, 2007).

Siblings are also an important source of support, especially older siblings (Marsiglia et al., 2002), however Crosnoe and Elder (2004) found that Latino adolescents had less sibling support than adolescents from other ethnic groups. Having older brothers in college was a significant predictor in college attendance for Mexican American students (Hurtado-Ortiz & Gauvin, 2007). Ideally, a measure of sibling support would be included in the family microsystem, but Add Health inconsistently collected data for siblings.

A great deal of research has focused on family factors directly related to helping with schoolwork and involvement (which fall into the family-school mesosystem, not addressed in this study), rather than parent support or other family factors. This is a limitation because of the value of *familismo* and key differences in beliefs and values related to education for Latino families. Additionally, Latino parents might provide support for their children's education in ways that differ from White, middle-class models (Hoover-Dempsey, Walker, Sandler, Whetsel, Green, Wilkins, et al., 2005; Mitra, 2006). Auerbach (2007) identified many patterns of parent roles in education that differed

from direct, instrumental help. First, Latino parents believe in moral and emotional support at home, which they believe allows their children to succeed as students. Many advocate *educación*, meaning families must teach morals and respect to children, and this provides the foundation for formal education, provided by teachers. Second, Auerbach found that parents who tried to provide more direct support and get involved with schools found themselves frustrated and lacking the knowledge and experience to adequately help their children.

Friends. Positive relationships with peers (Figure 1, #3) has been explored as a key protective factor for at-risk young people (Criss, Pettit, Bates, Dodge, & Lapp, 2002; Luthar, 2006; Masten & Coatsworth, 1998). There is likely an important and complex relationship between supportive friendships and positive school outcomes (Suárez - Orozco, Todorova, & Qin, 2006). The positive relationship between academic performance and having friends who are academically orientated is likely a matter of both selection and socialization (Crosnoe, Cavanagh, & Elder, 2003). Having a supporting network of friends can help immigrant adolescents to develop bicultural identities, feel motivated, and provide instrumental help completing schoolwork and navigating the school system (Suárez -Orozco et al., 2006). This is also shown in a study about Mexican adolescents' life satisfaction, an important theme they identified was that friends were a source of help and fun (Edwards & Lopez, 2006). In another example, a Mexican teen girl's drop in school performance was attributed to losing the privilege of playing in the school band, so she lost touch with "good" friends and fell in with a "bad" crowd (Romo & Falbo, 1996). For Mexican adolescents, mutual help (in general and with homework) was the most important feature of friendship, which is contrasted with White

American adolescents who said having fun and good communication were the most important (Suárez -Orozco & Suárez -Orozco, 1995). Friend support had a direct relationship with school engagement in a study of Latino middle school students (Garcia-Reid et al., 2005).

Friends' GPA is a strong predictor of school performance (Cook, Deng, & Morgano, 2007). Students were asked to report who their closest friends were, and the grades of the peer group was a very strong predictor of an individual's academic performance (Wentzel & Caldwell, 1997). A longitudinal study found that friends' GPA was positively related to less off-track behavior one year later and there were no ethnic differences (Crosnoe et al., 2003). When high school students had friends who planned to go to college, they were six times more likely to go to college themselves (Cooper, Chavira et al., 2005). Having friends who valued education was negatively associated with dropping out of school (Ream & Rumberger, 2008).

However, Latinos are more likely to put their family responsibilities first and have less peer-group orientation than White adolescents (Garcia-Reid et al., 2005). Latinos also tend to spend less time with their friends compared to White adolescents (Crosnoe & Elder, 2004). Additionally, delinquent peers can have a negative impact on school outcomes. Associating with deviant peers was associated with lower grades in both tenth and twelfth grades (Furlingni, Eccles, Barber, Clements, 2001). Latino immigrant adolescents frequently live in poor communities with high exposure to peer crime and drug use (Pantin et al., 2003). Mexican American dropouts were more likely to have delinquent peers than students who were doing well in school, a relationship that was slightly stronger for girls (Chavez, Oetting, & Swaim, 1994). Young people with

conventional peers (who were not involved with drugs and did well in school) were more likely to have better school performance (Cook et al., 2007).

Mesosystems

Microsystems do not exist independently; there is a reciprocal relationship between these important influences in an adolescent's life. Moreover, understanding the mesosystems contributes to a better understanding of development. Stronger mesosystems (that is stronger relationships between microsystems) are associated with more positive child outcomes, but mesosystems with weak connections "or comprise relationships that are antagonistic increase a child's risk for maladaptive development" (Szapocznik & Coatsworth, 1999, p. 339). The mesosystems can explain additional variance beyond that of the microsystems (Coatsworth et al., 2000). However, mesosystem factors have been examined less frequently than microsystem factors, though evidence supports the protective influence of parent-school and parent-peer connections (Szapocznik & Coatsworth, 1999). This study will provide greater structure through theory and contribute to a more thorough picture of the relationship between these factors and educational outcomes.

Family-friend mesosystem. Recall from an earlier section ("Ecodevelopmental Framework") that the mesosystem should not be confused with cross-domain measures in which there is no direct contact between microsystems (Brown, Mounts, Lamborn, & Steinberg, 1993; Szapocznik & Coatsworth, 1999). The focus here is on direct links between family and friends (Figure 1, #4), which is important to Latino parents – for example, parents' active monitoring of friends, getting to know the parents of children's friends, and management of time spent with friends. A longitudinal study found that

Latino students were more likely to graduate when their parents got to know their children's friends; parents approved of some friendships but disapproved of others they believed threatened children's school success (Romo & Falbo, 1996). In a study of Latino families, parents were very concerned about the possible friends' bad influences, or *malas compañías* (bad company) (Cooper, Brown et al., 2005). Closer family-friend ties have been identified as protective and contributing to better school achievement (Cleveland & Crosnoe, 2004). Adolescents had better grades and were less likely to drop out of high school when they had parents who knew the parents of their children's friends (Glanville, Sikkink, & Hernandez, 2008).

The link between family and friends can be complicated. Crosnoe and Elder (2004) found that for Hispanic adolescents who were distanced emotionally from their parents but who had strong friend support, there was increased risk of educational problems; the strong friendships did not counteract the negative effect of the parent-child relationship, but instead exacerbated it.

Macrosystems

Societal-level factors also influence adolescents' microsystems, mesosystems, and the development of individual traits. Macrosystem factors include specific country of origin, immigrant generation, and gender roles.

Latino country of origin. This study will focus on Mexican youth, avoiding the problems associated with combining all Latinos into one analysis. Latino is a panethnic category that includes many different cultures with different demographics (see Table 2), values, and histories. Ignoring the country of origin potentially masks important differences between specific ethnic groups. Researchers support exploring countries of

origin within large panethnic groups whenever possible (Rumbaut, 2008). In terms of demographics, Cubans tend to have higher education, lower unemployment, and greater income levels and less poverty compared to other Latino groups. Puerto Ricans are at the opposite end of this spectrum, and Mexicans and other groups from Central and South America are between Cubans and Puerto Ricans. Mexicans have the highest unemployment rates (Suárez -Orozco & Suárez -Orozco, 1995). Garcia and Bayer (2005) also found that Mexicans were significantly less likely to complete college compared to Whites; there were no significant differences between Puerto Ricans and Whites or Cubans and Whites. These differences potentially confound results and justify focusing on only one country of origin.

Table 2

Hispanic Ethnic Groups in the United States

	Percent Latino population	Educational attainment, percentage of population over age 25			Median income	Poverty rates, under 18
		Less than high school	High school or more	Bachelor's degree or more		
Hispanic, overall		40.4	59.6	12.7	\$35,929	28.6
Mexican	64	47.6	52.4	8.6	\$35,185	30.3
Puerto Rican	9.6	28.6	71.4	16.2	\$34,092	30.3
Cuban	3.6	25.8	74.2	25.3	\$38,256	15.8
Dominican	2.6	38.4	61.6	14.5	\$29,624	32.7
Central American	7.2	47.2	52.8	10.8	\$36,369	22.5
South American	5.5	15.5	84.5	29.3	\$43,788	16.5

Note. Adapted from “The American Community—Hispanics: 2004” by US Census Bureau, 2007, Retrieved from www.census.gov/prod/2007pubs/acs-03.pdf.

Immigration generation. Most Hispanics are immigrants (first generation) or children of immigrants (second generation): nationwide, 58.8% of young adult Hispanic males are foreign-born and 21.5% have at least one parent who is foreign-born. Many researchers have found immigrants who come to the US as children (1.5 generation) are quite different from those who come as adults and should be considered a separate group (Rumbaut, 2008). Work by Carola and Marcelo Suárez-Orozco (1995, 2001) has shown the importance of studying Mexican heritage youth based on their immigration generation. They have found distinct patterns of educational beliefs for Mexican youth in Mexico, Mexican immigrants in the US, and youth born in the US to Mexican immigrants.

Rumbaut (2008) also identified distinct patterns of education, risk, and other factors among different generations of immigrants from different countries (see Table 3). Grant and Rong (1999) separately evaluated the years of schooling completed by Mexicans and Hispanics from other countries and found different trends. First-generation Mexicans had an average of 9.4 years while other Hispanics averaged 11.1 years. Second-generation Hispanics from other countries had the highest average compared to first- and third generation, but second- and third-generation Mexicans had nearly the same average. Wojtkiewicz and Donato (1995) also found second-generation and third-generation Mexicans were more likely to graduate from high school than first-generation; third-generation Mexicans were also more likely to graduate from college than the second generation.

Newer Latino immigrants were generally enthusiastic and diligent students, but Latinos who immigrated as younger children or were born in the US showed less interest,

opposed authority, and were more likely to drop out compared to the newer immigrants (Suárez -Orozco & Suárez -Orozco, 1995). Immigrant Latino adolescents' educational

Table 3

Mexican Highest Educational Attainment by Immigrant Generation (in Percentages)

	High school dropout	High school graduate	Bachelor's degree (25 and older)
1.5 generation	29.6	26.5	10.3
2 nd generation	15.0	28.9	11.7
3 rd generation	18.5	26.4	13.7

Note. Adapted from "Divergent destinies: Acculturation, social mobility, and adult transitions among children of Latin American and Asian Immigrants" by R. G. Rumbaut, 2008, March, Paper presented at biannual meeting of the Society for Research on Adolescence, Chicago, IL.

aspirations or beliefs in the importance of school did not differ by academic competence, but US-born Latinos' aspirations and the importance of school did differ depending on their competence. Latinos who immigrated before age 12 had higher educational expectations compared to those who moved to the US as teens (Ibanez et al., 2004).

Okagaki and Frensch (1998) looked at how Latinos parenting beliefs and practices vary depending on whether they immigrated or were born in the US. Mexican parents who immigrated to the US were more likely to encourage their children to conform to standards than to support autonomous behavior, while Mexican parents who were born in the US had views more similar to Euro-American parents regarding independence and individual achievement. Another difference reported by Okagaki and Frensch was that immigrant Mexican parents believed it was more important for their younger children to learn to do their school work neatly than to learn facts and develop problem-solving skills and creativity.

Gender. As a social construction, rather than a biological factor, gender is considered a macrosystem factor rather than an individual factor in this study. Resilience research has neglected to recognize gender differences in outcomes, or the social support and individual characteristics associated with those outcomes (Boyden & Mann, 2005). There are inconsistencies in the literature as to whether Latino boys or girls are more successful in school, because of differences in how outcomes are measured and the exact sample. Nationally, 58.5% of Latinas and 48.0% of Latinos graduate from high school (Swanson, 2004). According to some estimates, Hispanic girls are more likely to drop out of high school compared to Hispanic boys and to other ethnic groups (Hernandez et al., 1994). Latinas report that school is more important to them than male Latino students (Ibanez et al., 2004). The risk of dropping out and the reasons for doing so are different for Latino boys and girls, and there are likely differences in the processes associated with staying in school and graduating. Stearns and Glennie (2006) found that the most common reason Latino boys in ninth through eleventh grade left school was for employment reasons, though it was not clear if this was related to family necessity. One-third of Latinas in one study left school because they were pregnant or getting married (Zambrana & Zoppi, 2002).

There are a number of theories and research studies that lead to expectations for gender differences in Latinos' educational attainment, and the literature also makes it unclear whether boys or girls have greater attainment. At the postsecondary level, Sciarra and Whitson (2007) found that Latina women were over one and a half times more likely to complete a bachelor's degree compared to Latino men. However, another study found that boys were more likely to complete a bachelor's degree (Garcia & Bayer, 2005).

Second and third generation women from Mexico achieved more years of schooling than males; however, for Hispanics from other countries gender differences were not significant (Grant & Rong, 1999).

Latino parents have different rules for their sons and daughters—boys are allowed more freedoms, like going out with friends on their own, and parents believe boys should develop *malicia* (“street smarts”); girls are more restricted by their parents, report less interest in school, and more trouble with school work (Reese et al., 2000). In another study, Latino parents were more likely to restrict or monitor their daughters than sons (Cooper, Brown et al., 2005). Sons and daughters in Latino families might also have different expectations from elders. For some Latino families, girls are expected to put their family’s needs before their schooling, meaning they should drop out and work full-time (Calderon, 1998). If families cannot support the education of all their children, sons are more often given priority over daughters (Garcia & Bayer, 2005). Latinas are also likely to be raised with more traditional gender role attitudes and behaviors (*marianismo*), which includes submissiveness, dependence, and caretaking which might then be reinforced by the media and schools; these attitudes and behaviors make it more difficult for Latinas to form and then follow their own goals, including educational pursuits (Zambrana & Zoppi, 2002). Latinas reported feeling more support from friends, siblings, and teachers, but there is some question as to how much this translates to better educational outcomes (Crosnoe & Elder, 2004).

High school graduation is an important standard of success and college graduation rates among Mexicans have been small, necessitating more information about the factors related to these outcomes. Individual factors and relationships with family and friends

have an impact on these outcomes and examining them together is essential. By bringing factors together with a theoretical basis, this study will contribute to an important and evolving literature about Mexican students in the US.

CHAPTER 2: METHOD

Study Design

The National Longitudinal Study of Adolescent Health (Add Health) is a nationally representative study of adolescents in the US (Harris, 2008). Data were collected at four time points from 1994-2008 and include data from adolescents/young adults, parents, school administrators, and the US census (though this study did not use this source).

Participating schools were selected from a list of 26,666 high schools in the US from a sample frame organized by enrollment size, school type, census region, urbanization, and percent of the student population who was European American. Based on this list, a sample of 145 schools (high schools and feeder junior high and middle schools) was selected using unequal probability selection based on enrollment size. If a school declined to participate, then the next school in the sampling frame was selected.

Participants were selected at Wave I using unequal probability from school rosters. Several subpopulations were oversampled for the in-home Survey: black adolescents with college-educated parents, Cuban, Puerto Rican, Chinese, and physically disabled adolescents. There were 20,745 participants who completed the in-home interview at Wave I (the response rate was 78.9%). Wave IV followed up with participants from Wave I about 13 years later when they were 24 to 32 years old, with a response rate of 80.3%. Because of the study design of Add Health, response rates, rather

than attrition or retention rates, are considered a more appropriate statistic (Harris, Halpern, Entzel, Tabor, Bearman, & Udry, 2008).

In-School Survey. Seventh through twelfth grade students from the 145 schools participated in the in-school surveys at Wave I. Parental consent was required and passive or active student assent was used, depending on what was required by the individual schools. A total of 90,118 students completed the 45-minute questionnaire and these participants were not compensated. The survey included questions about family background, friends, school and school activities, and general health questions.

Students were asked to name up to five friends of each sex, using class lists and identification codes. If these friends also completed the in-school survey their responses are accessible, providing a direct measure of the friendship group, rather than an indirect measure of an individual's perception of their friends. This network data was used to compile three measures of the friends: GPA, school connectedness, and college expectations.

In-Home Interviews. Waves I, II, III, and IV included surveys completed by students in their homes using Computer-Assisted Personal Interviews (CAPI). Certain sensitive sections were completed through Computer-Assisted Self Interviews (CASI). Each survey took about 1 to 2 hours to complete. Participants received \$20 for completing the Wave I in-home interview and \$40 for the Wave IV questionnaire. The questions asked participants about health, school, relationships, behaviors, and beliefs.

Parent Interview. One parent or guardian for each participant who completed the in-home interview was interviewed at Wave I about family demographics (including ethnicity, family structure, employment, and education), health information about the

parent and adolescent, and information about their child (e.g., relationship quality, school involvement, and about child's friends). Parents were not compensated. About 85% of adolescents had one parent interviewed, and 93% of those parents were female.

Sample. The current study included Mexican adolescents who completed the Wave I in-home interview and who were in grades 7 through 11 during Wave I (total $n = 1257$). The sample includes 47.8% girls and 52.1% boys. Participants selected the Hispanic backgrounds they identified with. Seventy-eight percent were born in the United States. See Table 4 for a list of all variables in this study.

Demographic Measures

Mexican background. At Wave I participants answered whether they were Hispanic and those who answered yes were then asked to specify whether their background included Mexican, Chicano, Cuban, Puerto Rican, Central or South American, or other. Participants were permitted to indicate more than one background ethnicity. Students indicating they were Mexican or Chicano were retained for this study. Mexicans are the largest Latino group in the US and in the Add Health study, so understanding the patterns for this group is of interest and will contribute to existing literature about Mexicans specifically. Mexicans also have lower educational attainment and family risk factors (reviewed in previous section) justifying a more in-depth look in the current study.

Grade. At Wave I participants were in grades 7 through 12. This study of involved only those participants who were in grades 7 to 11 at Wave I. Grade level was controlled for in multivariate analyses using a series of dummy coded variables (with grade 7 as the reference group).

Immigrant generation. The immigrant generation of the adolescents was determined from several questions at Wave I: whether they were born in the US (question was skipped if student said they had lived at the current address since birth), if their biological parents were born in the US (yes or no), and the age the adolescent came to the US if they were born in another country (month and year of birth subtracted from month and year moved to the US). *First generation* adolescents were born in another country and came to the US as an older child (i.e., age 10 or older). *1.5 generation* adolescents were also born in another country but came to the US at age 9 or younger. *Second generation* adolescents were born in the US but one or both parents were not. *Third+ generation* adolescents and their parents were born in the US. Many researchers argue third generation and later generations are similar and may be combined (Harker, 2001).

Socioeconomic status (SES). Two separate measures of SES were used: mean of parents' education and household income, both reported on the parent interview. Parents were asked for their highest level of schooling, as well as that of their current partner or spouse, and the two were averaged. There were 10 options for highest level of schooling ranging from "never went to school" to "professional training beyond 4-year college or university" (or "don't know" for current partner). Parents also estimated their total annual income for the household, reported in thousands of dollars.

Other demographics. Sex (reported on the in-school survey) was used to assess differential effects as a function of gender. Language spoken at home was measured at Wave I, and in the analyses, families speaking Spanish are differentiated from those speaking English. A binary variable to compare youth living with both biological parents at Wave I to all others was also considered in this study.

Outcome Measures: Educational Attainment

Participants were asked at Wave IV (participants were aged 24 and older) the highest grade they had completed. There were 22 possible options for highest level of education ranging from “6th grade” through “5 or more years of graduate school.” Two dichotomous outcomes were explored: high school graduation and college graduation (completion of a 4-year degree). In a longitudinal study, Ou (2008) found there were differences between GED recipients, high school graduates, and dropouts in several outcome measures, therefore this study did not define those who earned a GED as high school graduates.

Predictors: Individual Factors

The conceptual model (Figure 1) provides a visual depiction of the predictors in the various systems. All predictors were from Wave I school surveys, in-home interviews, friend networks, and parent interviews. The parts of Figure 1 are labeled with numbers to facilitate reading. There are five individual factors (Figure 1, #1).

Positive well-being. Four items asked about how much the adolescents enjoyed life, felt happy, felt as good as other people, and felt hopeful about the future. Scale responses included: never or rarely, sometimes, a lot of the time, or most of the time or all of the time. This scale was used in a previous study using Wave II data and had a reliability of $\alpha = .72$ (Harker, 2001). The four items were standardized and averaged. For this study, the reliability of the scale was adequate, $\alpha = .64$.

Self-esteem. Six items measured self-esteem that were derived from previous scales (e.g., Rosenberg, 1989) or adapted specifically for Add Health (Russell, Crockett, Shen, & Lee, 2008). These items were standardized and averaged to form this scale.

Participants answered how much they felt they had good qualities, had a lot to be proud of, liked themselves, were doing things right, felt socially accepted, and felt loved and wanted; responses ranged from 1 (strongly agree) to 5 (strongly disagree). One previous study performed a PCA on these items and the first factor accounted for 58.99% of the variance with a reliability of $\alpha = .86$ (Galliher, Rostosky, & Hughes, 2004). The reliability for this scale for this study was strong, $\alpha = .84$.

College beliefs. Two items made up this scale, consisting of college aspirations and expectations. *Aspirations* were measured with the item “On a scale of 1 to 5, where 1 is low and 5 is high, how much do you want to go to college?” to determine how much participants want to go to college and measures to a certain degree hopefulness and an abstract ideal. *Expectations* were measured with the question “On a scale of 1 to 5, where 1 is low and 5 is high, how likely is it that you will go to college?” and asks for a more realistic evaluation. These constructs were used by Bohon and colleagues (2006) to examine differences between Latino ethnic groups in the Add Heath study. Both items were standardized and averaged to create this scale. The reliability for this scale was $\alpha = .82$.

Personal control. Adolescents answered one question about how much they agree that when they get what they want it is usually because they worked hard. Responses ranged from 1 (strongly agree) to 5 (strongly disagree). This item was used by Pearson (2006) to measure personal control.

Problem solving. There were seven questions about problem solving. Adolescents were asked if: they go out of their way to avoid dealing with problems, difficult problems make them upset, they go with a “gut feeling” and do not think too

much about consequences or alternatives, they get as many facts about problem as possible, they usually try to think of as many approaches as possible, they use systematic method for judging alternatives, and after carrying out a solution they try to analyze what went right and wrong. Responses were coded 1 (strongly agree) to 5 (strongly disagree). This scale has not been used in a published study in the literature. The reliability for this scale was not strong, so three items were eliminated (the first three listed) and reliability improved to $\alpha = .74$. The remaining items were standardized and averaged.

Predictors: Family and Friend Microsystem Factors

Parental support. There are five measures of the family microsystem (Figure 1, #2). Adolescents responded to five items about support from each of their parents. These two scales were previously used and the alphas at both Wave I and II were in the acceptable range between $\alpha = .79$ and $.88$ (Bartlett, Holditch-Davis, Belyea, Halpern, & Beeber, 2006). Participants reported how close they felt to each parent and how much their parents cared (1 = not at all, 5 = very much), how much they agreed that their parents were loving and warm, how much they were satisfied with parent-child communication, and how much they were satisfied with the overall relationship with their parents (strongly agree, agree, neither agree or disagree, disagree, strongly disagree). The reliability for support from mom and support from dad were figured separately, both with good reliability, $\alpha = .86$. The items were standardized and averaged to create a maternal and paternal support scale, and the highest score was used (if a participant only responded for one parent, that score was used).

Parental report of relationship quality. Parents answered four questions about how often they trust and understand their child, how well they got along, and whether

they make decisions together. Responses were coded from 1 (always) to 5 (never). The items were standardized and then averaged. The reliability for this scale was weak, but one item was eliminated (“You just don’t understand him/her”) and the new reliability was $\alpha = .65$.

Parent-child shared activities. Participants were given a list of activities and reported yes or no to indicate whether they had done each with either of their parental figures in the past four weeks. Activities included going shopping, playing a sport, attending religious services, doing school work, and going to a movie, discussing a personal problem, and talking about a dating partner or party. Two separate constructs have been previously used and shown to be valid (Ream & Savin-Williams, 2005). Separate scales were created for moms and dads by adding the items and the highest score was used (if a participant only responded for one parent, that score was used) and the reliabilities were $\alpha = .60$ and $\alpha = .63$ for mom and dad respectively.

Parental control. Adolescents answered seven items about whether their parents allow them to make their own decisions about: who they hang out with, curfew on weekends, what they wear, how much television they watch, what TV shows they watch, bedtime on weeknights, and what they eat. Responses were yes or no and the items were summed to create a score. Nowlin and Colder (2007) reported reliability of $\alpha = .63$. This scale was also used previously by Morgo-Wilson (2008). The reliability for this study found $\alpha = .62$.

Parents’ high school and college expectations. Adolescents were asked on a scale of 1 to 5 (“where 1 is low and 5 is high”) how disappointed each of their parents would be if they did not graduate from high school (*high school expectations*) and if they

did not graduate from college (*college expectations*). The highest parent's score was used (if a participant only responded for one parent, that score was used). Because the high school expectations measure was skewed, this item was logged. The measure of high school expectations was used when considering the high school graduation and college expectations was used when considering college graduation.

Friend support. The friend microsystem was measured by several factors (Figure 1, #3). Adolescents responded to five questions about their closest male and female friends, which included if they had gone to their house, hung out, gone somewhere, talked about a problem, or spoke on the phone. Question responses were yes or no and the items were added to create the scales. The total 10-item scale had adequate reliability with $\alpha = .68$ for Wave I and $\alpha = .66$ at Wave II (Henrich, Brookmeyer, Shrier, & Shahar, 2006). In this study, the reliability for female friend support and male friend support were calculated separately, with $\alpha = .68$ and $\alpha = .63$ respectively. The friend support scale was the score for the friend who was the same sex as the participant.

Friends' GPA. The in-school survey asked students to name their closest friends. If these friends also completed surveys, their responses were accessed. This variable was calculated based on reports from friends, not individuals estimating their friends' grades. Each student reported their grades in math, science, English, and history to calculate GPA. The network GPA was the total of friends' GPAs divided by the number of friends (Haynie & Payne, 2006).

Friends' school connectedness. School connectedness was measured by three items from the participants' friends: whether they feel close to people at school, feel like a part of the school, and if they are happy to be there (1 = strongly agree; 5 = strongly

disagree) (Crosnoe et al., 2003). The network data for each participant includes a mean for the responses the participants' friends provided for each item. The reliability for this scale was $\alpha = .74$.

Friends' college expectations. The in-school survey questioned how likely it was that the student would graduate from college (0 = no chance; 8 = it will happen). This variable was accessed for the participants' friends who completed the in-school survey. Similar to friends' GPA and school connectedness, the mean of friends' responses was used for this measure.

Substance-using peers. Adolescents were asked three questions about their three closest friends and how many of them smoke everyday, drink once a month, and smoke marijuana once a month. Responses were no friends, one, two, or three friends. This scale was used previously, though with a sub-sample of sibling pairs, with $\alpha = .76$ for Wave I and $\alpha = .77$ for Wave II (Beaver, Shutt, Boutwell, Ratchford, Roberts, & Barnes, 2009). These items were standardized and averaged and the reliability for this scale was $\alpha = .76$.

Predictors: Family-Friend Mesosystem Factor

Parent connection to adolescent's friends. There was one measure of the family-friend mesosystem (Figure 1, #4). At Wave I, parents were asked four questions to assess how well they knew the friends of their adolescent child in the study: whether they know what school the closest friend attends, if they met this friend in person, if they met the friend's parents, and how many friends' parents they had talked to in the last four weeks. The first three items were yes or no responses and the last question parents could answer from 0 to 6 or more. Cleveland and Crosnoe (2004) converted the last item to a none versus some dichotomous variable. These four items were then summed. Previous

use of this scale (called intergenerational closure) found $\alpha = .67$ (Cleveland & Crosnoe, 2004). This study found a scale reliability of $\alpha = .72$.

Analyses

The Add Health data set employed a complex longitudinal design (Chantala & Tabor, 1999). Due to oversampling, students had an unequal probability of inclusion. Sampling weights are used to adjust for this difference (Kaplan & Ferguson, 1999). The weights reflect the different sample sizes of each group relative to a base group. This method is most appropriate for representative samples (Cohen, Cohen, West & Aiken, 2003) and utilization of the sampling weights allows the results of the study to be generalized to the population (i.e., in this study, the population of Mexican youth in the US). The sample also represents a clustered design, where individuals are nested in communities and schools. As a result, all analyses were performed in SAS Version 9.2 and Mplus Version 5.2 and utilized survey procedures which properly account for both the sampling weights, domain analysis, and nested design.

There were not considerable missing data from the in-home interview, there was some from the parent interview, but there was a large amount of missing data from the friend-network variables. The percentage of missing data ranged from 0% to 56% (see Appendix A). To ensure the results are not biased due to missing continuous variables, data were imputed using the Imputation and Variance Estimation Software routines (IVEware, Raghunathan, Solenberger, Van Hoewyk, 2009). Twenty datasets were imputed and analyses were conducted within each dataset. The results were then combined across imputations using the procedure outlined by Rubin (1987). Average

parameter estimates were calculated using all datasets and standard errors account for the uncertainty in the estimates due to missing data.

Analytic procedures were guided by two research questions:

1. *How does high school graduation and college graduation of Mexicans vary as a function of gender and immigrant generation?* Bivariate analyses explored statistical differences in high school and college graduation based on gender and immigrant generation.

2. *How do individual resiliency factors, family and friend microsystems, and the family-friend mesosystems predict high school graduation and college graduation of Mexicans?*

For each outcome (i.e., high school graduation and college graduation), bivariate regression analyses were first conducted between each factor and the outcomes. This indicated how each factor alone is related to the outcomes.

Second, each domain of predictors (controls, individual, family, friend, and mesosystem) was separately specified to predict the outcomes. These five separate regressions indicated how the factors belonging to each domain together predicted the outcomes. The goodness of fit of the models was assessed using a pseudo- R^2 . Unlike in OLS regression, this measure of R^2 should not be interpreted as the percentage of variance accounted for (Cohen et al., 2003). Measures of R^2 for logistic regression tend to be smaller, which must be considered when examining the results so models are not misinterpreted as being poor. However, pseudo- R^2 s still offer a useful estimation of how well the model predicts the outcomes. The pseudo- R^2 s reported here were calculated in Mplus, which generates the McKelvey-Zavoina pseudo- R^2 (McKelvey & Zavoina, 1975).

A Monte Carlo study found this estimation of R^2 was the best estimation of goodness of fit and produced the least bias (DeMaris, 2002). This statistic is described as “the proportion of variability that would be accounted for by the predictor set in the dependent variable if it were measured on a continuous scale” (DeMaris, 2002, p. 37). However, even with the advantages the McKelvey-Zavoina pseudo- R^2 has, it is still an estimation of explained variance, not a true measure of variance accounted for.

Next, the non-significant predictors within each domain were removed and the change in model fit was assessed using a Wald χ^2 for nested models. These tests were used to determine if the non-significant predictors could be removed without significantly reducing the overall model fit. These models resulted in a trimmed model for each domain that included only the significant predictors.

Lastly, a final, full model was tested using hierarchical logistic regression. The order was informed by a study by Coatsworth and colleagues (2000), who used the ecodevelopmental framework and began with the demographics, then entered the microsystem measures (family first, then friend), then mesosystem variables. Only the significant variables retained in the domain analyses were included in this final model. In order to obtain a measure of the significance of the set of predictors in each domain, Wald χ^2 was calculated for each step. A significant Wald χ^2 means the predictors contributed to the prediction of the outcome over and beyond the previous model in the hierarchical sequence.

CHAPTER 3: RESULTS

Descriptive Findings

The continuous measures were standardized to a mean of 0 and a standard deviation of 1 prior to analyses. The percentage of missing values for each variable or scale is found in Appendix A. Descriptive statistics for all study variables for Mexicans who were in grades 7 through 11 at Wave I are provided in Table 4. Over half reported they lived with both biological parents (56%). Most participants were born in the US (second generation or higher) and 22% were foreign-born (first generation or 1.5 generation). Just under half of the participants spoke Spanish at home. In total, 73% of the students graduated from high school, and 14% completed college. A correlation table is found in Appendix B.

Gender Differences in Educational Outcomes

Bivariate analyses were used to determine if there were significant differences in the probability of high school graduation and college graduation by gender. Figure 2 shows the predicted probabilities of graduating from high school and college for each gender. Most boys (72%) and girls (75%) did graduate from high school, and 12% of boys and 15% of girls graduated from college. Analyses did not find significant gender differences for high school graduation, $OR = 0.87$, $p = .459$, 95% CI [0.59, 1.27]. There were also no significant differences for college graduation, $OR = 0.76$, $p = .336$, 95% CI [0.44, 1.32].

Table 4

Study Variables' and Sample Descriptive Statistics

	Weighted percentage	Source, from child unless specified
High school graduate	73.39	In-Home, Wave IV
College graduate	13.87	In-Home, Wave IV
1 st generation	7.79	In-Home, Wave I
1.5 generation	13.76	In-Home, Wave I
2 nd generation	36.10	In-Home, Wave I
3 rd generation+	42.35	In-Home, Wave I
Spanish spoken at home	42.64	In-Home, Wave I
Lives with both biological parents	55.66	In-Home, Wave I
Male	52.13	In-Home, Wave I
	Standardized Cronbach's alpha	Source, from child unless specified (number of items)
Individual		
Positive well-being	.64	In-Home, Wave I (4)
Self-esteem	.84	In-Home, Wave I (6)
College beliefs	.82	In-Home, Wave I (2)
Problem solving	.74	In-Home, Wave I (6)
Personal control	-	In-Home, Wave I (1)
Family Microsystem		
Parental support	.86/.86 ^a	In-Home, Wave I (5/10) ^a
Parent-child relationship quality	.65	Parent, Wave I (3)
Shared activities	.60/.63 ^a	In-Home, Wave I (7/14) ^a
Parental control	.62	In-Home, Wave I (7)
Parents' high school expectations	-	In-Home, Wave I (1/2) ^a
Parents' college expectations	-	In-Home, Wave I (1/2) ^a
Friend Microsystem		
Friend support	.68/.63 ^b	In-Home, Wave I (5) ^b
Substance-using peers	.76	In-Home, Wave I (3)
Friends' GPA	-	In-school, reported by friends (mean 4 grades)
Friends' school connectedness	.74	In-school, reported by friends (3)
Friends' college expectations	-	In-school, reported by friends (1)
Mesosystem		
Parent-friend connected	.74	Parent, Wave I (4)

Note. ^a When participants responded to separate questions for mom and dad, two scales were calculated separately. When participants responded for two parents, the highest of the two was used and if they only responded for one parent that score was used. ^b Male and female friend support scales were calculated separately (each with 5 items). Friend support is for the participant's same-sex friend.

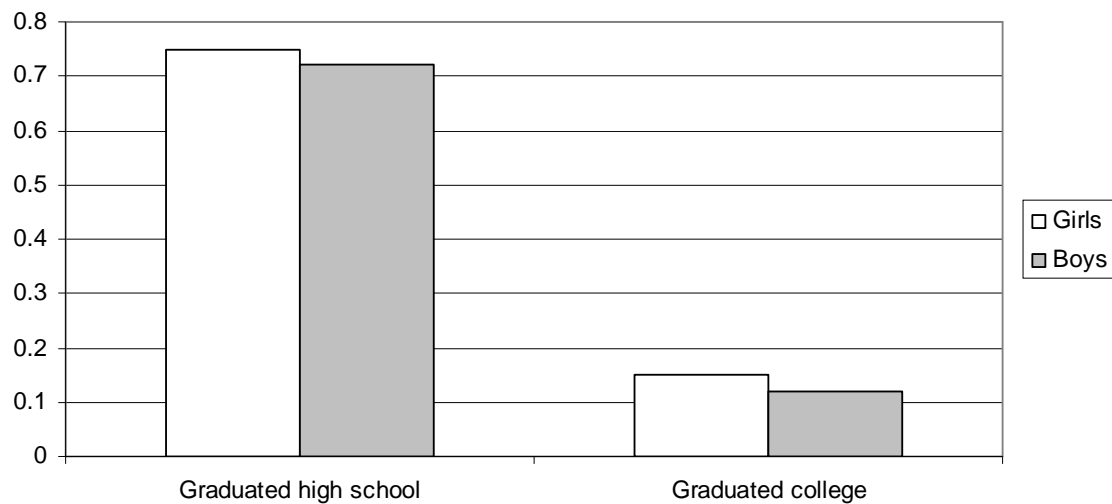


Figure 2. Predicted probability of high school and college graduation by gender.

Immigrant Generation Differences in Educational Outcomes

To determine outcome differences by immigrant generation, each educational outcome was regressed on three dummy coded indicators to compare 1.5 generation, second generation, and third plus generation adolescents to first generation adolescents. Figure 3 shows the predicted probabilities for both high school and college graduation. Similar to gender, most students from all immigrant generations graduated from high school but did not graduate from college. High school graduation rates were 73% of first generation, 71% for 1.5 generation, and 74% for both second and third generation plus. The results indicate no significant differences in high school graduation between first generation and 1.5 generation ($OR = 0.91$, $p = .882$, 95% CI [0.28, 2.94]), second generation ($OR = 1.09$, $p = .853$, 95% CI [0.43, 2.81]), or third generation plus ($OR = 1.05$, $p = .950$, 95% CI [0.44, 2.51]).

The rates of college graduation were 12% for first generation, 10% for 1.5 generation, 13% for second generation, and 16% for third generation plus. For college graduation, there were no significant differences between first generation and 1.5 generation ($OR = 0.81, p = .751, 95\% CI [0.24, 2.84]$), second generation ($OR = 1.11, p = .851, 95\% CI [0.37, 3.38]$), or third generation plus ($OR = 1.36, p = .566, 95\% CI [0.48, 3.84]$).

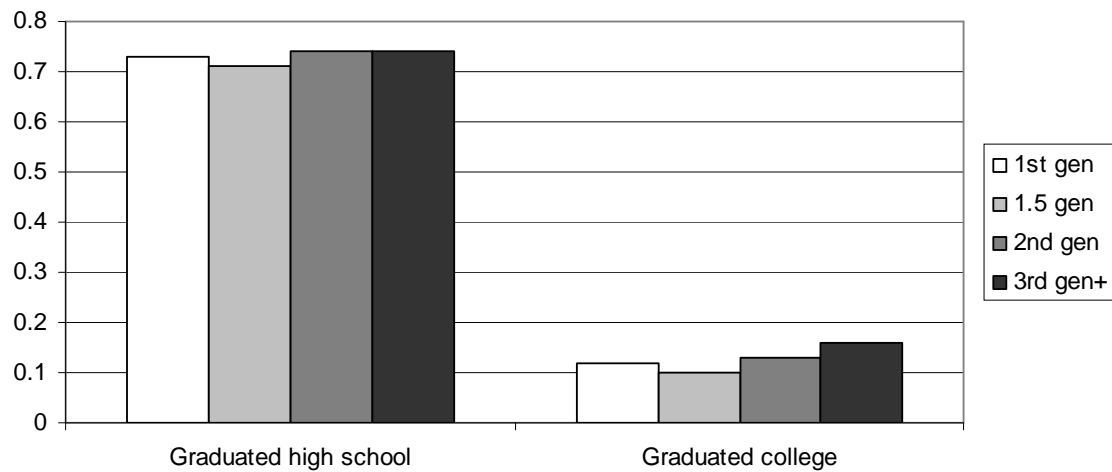


Figure 3. Predicted probability of high school and college graduation by immigrant generation.

Predictors of High School Graduation

Correlations between weighted study variables (averaged across the twenty imputations) are in Appendix B and multicollinearity was considered before subsequent analyses. No correlations were strong enough to raise concern.

First, bivariate logistic regression analyses were run between each predictor alone and high school graduation. The factors with significant estimates were living with both biological parents, family income, college beliefs, family support, relationship quality,

activities with parents, parents' expectations for high school graduation, friends' substance use, and friends' GPA. Three factors were marginally significant ($p \leq .06$): being in grade 11 (compared to grade 7), parent-friend connectedness, and personal control. In Table 5, the predicted probability of high school graduation for each category of each categorical variable is presented. In Table 6, three predicted probabilities of high school graduation for each continuous predictor is presented – differentiating between adolescents at the mean, one standard deviation below the mean, and one standard above the mean of the continuous predictor.

Table 5

Bivariate Estimates between High School Graduation and Categorical Variables

	Predicted probability of high school graduation	<i>OR</i>	95% CI	<i>p</i>
Spanish not in home*	.73			
Spanish in home	.74	1.09	[0.69, 1.72]	.706
Doesn't live with both biological parents*	.67			
Lives with both biological parents	.78	1.77	[1.18, 2.66]	.006
Grade 7 at baseline*	.71			
Grade 8 at baseline	.64	0.72	[0.37, 1.40]	.337
Grade 9 at baseline	.75	1.24	[0.64, 2.40]	.522
Grade 10 at baseline	.76	1.32	[0.64, 2.71]	.451
Grade 11 at baseline	.85	2.33	[0.99, 5.45]	.052

Note. * = reference group for categorical variables; *OR* = odds ratio; CI = confidence interval.

Separate domain analyses. Next, a series of logistic regression models were specified to estimate the relationship between each domain and high school graduation. A separate, follow-up logistic regression also estimated the effects of trimmed domain

models that excluded the non-significant factors to determine whether removal of these effects significantly worsened the overall model fit. These analyses show the best fitting model for each domain.

Table 6

Bivariate Estimates between High School Graduation and Continuous Variable

	Predicted probability of high school graduation			<i>OR</i>	95% CI	<i>p</i>
	1 <i>SD</i>		1 <i>SD</i>			
	Below <i>M</i>	<i>M</i>	Above <i>M</i>			
Parental level of education	.70	.73	.77	1.18	[0.95, 1.47]	.142
Family income	.67	.74	.79	1.37	[1.07, 1.77]	.014
Positive well-being	.70	.73	.76	1.16	[0.90, 1.50]	.255
Self-esteem	.72	.73	.74	1.06	[0.88, 1.27]	.534
Problem solving skills	.72	.74	.75	1.09	[0.93, 1.28]	.299
Personal control	.70	.74	.77	1.19	[0.99, 1.42]	.060
College beliefs	.63	.75	.84	1.76	[1.44, 2.15]	.000
Parent support	.69	.73	.77	1.23	[1.00, 1.52]	.046
Parent-child relationship quality	.66	.74	.80	1.42	[1.12, 1.81]	.004
Parent activities	.68	.74	.78	1.29	[1.04, 1.61]	.023
Parent expectations for HS	.67	.74	.81	1.43	[1.17, 1.74]	.000
Parent control	.75	.73	.72	0.95	[0.76, 1.18]	.623
Friend support	.72	.74	.75	1.10	[0.90, 1.36]	.356
Friends' substance use	.77	.73	.69	0.82	[0.68, 0.99]	.044
Friends' connected to school	.74	.74	.73	0.95	[0.73, 1.24]	.719
Friends' college expectations	.69	.73	.77	1.22	[0.92, 1.62]	.164
Friends' GPA	.63	.74	.83	1.71	[1.31, 2.24]	.000
Parent-friend connectedness	.70	.74	.77	1.21	[1.00, 1.46]	.052

Note. *OR* = odds ratio; CI = confidence interval.

Table 7 displays the results for high school graduation. In the first model (Model A, the control model), living with both biological parents (*OR* = 1.59, *p* = .028, 95% CI [1.05, 2.40]), being in grade 11 (*OR* = 2.46, *p* = .047, 95% CI [1.01, 5.99]), and family

income ($OR = 1.33, p = .020, 95\% \text{ CI } [1.05, 1.69]$) were the predictors with significant coefficients. Pseudo- R^2 for this model equals .107.

In model B, the five predictors from the individual domain were added to Model A, the control model. The predictor college beliefs was the only significant individual factor in this domain, $OR = 1.94, p < .001, 95\% \text{ CI } [1.55, 2.43]$. Pseudo- $R^2 = .217$, which represented an increase of .110 over the control model. Constraining the non-significant individual factors to zero did not significantly worsen model fit, Wald $\chi^2(4) = 5.31, p = .257$.

Model C assessed the five variables in the family microsystem plus controls. Two family factors had significant estimates: parent-child relationship quality ($OR = 1.46, p = .002, 95\% \text{ CI } [1.15, 1.86]$) and parents' expectations for high school graduation ($OR = 1.33, p = .01, 95\% \text{ CI } [1.07, 1.65]$). Pseudo- $R^2 = .183$, which was .076 greater than the control model. When the non-significant family domain factors were constrained to be zero in the regression model, pseudo- $R^2 = .175$ and the model fit did not significantly worsen (Wald $\chi^2(3) = 1.495, p = .683$).

Model D included the five measures of the friend microsystem and controls. Friends' GPA was the only additional predictor from the friend domain that was significant, $OR = 1.77, p < .001, 95\% \text{ CI } [1.29, 2.41]$. Pseudo- $R^2 = .214$, an increase of .107 compared to the control model. Constraining the non-significant predictors from the friend microsystem to zero did not significantly worsen model fit, pseudo- $R^2 = .192$ and Wald $\chi^2(4) = 3.91, p = .418$.

Table 7

Logistic Regressions Predicting High School Graduation

Independent Variable	Model A (Controls)			Model B (Individual)			Model C (Family)		
	<i>OR</i>	95% CI	<i>p</i>	<i>OR</i>	95% CI	<i>p</i>	<i>OR</i>	95% CI	<i>p</i>
Generation 1.5	1.18	[0.38, 3.71]	.775	1.21	[0.37, 3.95]	.749	1.36	[0.40, 4.65]	.628
Second generation	1.27	[0.49, 3.27]	.621	1.04	[0.38, 2.79]	.945	1.50	[0.55, 4.09]	.426
Third plus generation	1.36	[0.48, 3.88]	.566	1.09	[0.36, 3.24]	.882	1.59	[0.51, 4.98]	.428
Spanish in home	1.42	[0.79, 2.56]	.237	1.17	[0.62, 2.18]	.632	1.27	[0.70, 2.29]	.432
Lives with 2 biological parents	1.59	[1.05, 2.40]	.028	1.58	[0.99, 2.55]	.057	1.58	[0.99, 2.52]	.055
Male	0.85	[0.57, 1.25]	.397	0.92	[0.59, 1.42]	.703	0.88	[0.59, 1.31]	.524
Grade 8 at baseline	0.70	[0.37, 1.33]	.276	0.63	[0.31, 1.26]	.191	0.76	[0.36, 1.57]	.452
Grade 9 at baseline	1.35	[0.67, 2.73]	.401	1.43	[0.66, 3.13]	.364	1.53	[0.75, 3.15]	.245
Grade 10 at baseline	1.39	[0.68, 2.85]	.364	1.57	[0.75, 3.31]	.233	1.68	[0.83, 3.39]	.152
Grade 11 at baseline	2.46	[1.01, 5.99]	.047	2.78	[1.09, 7.09]	.033	2.88	[1.07, 7.77]	.036
Parental level of education	1.20	[0.95, 1.52]	.120	1.10	[0.86, 1.41]	.453	1.18	[0.92, 1.53]	.199
Family income	1.33	[1.05, 1.69]	.020	1.37	[1.08, 1.73]	.008	1.27	[1.01, 1.60]	.043
Positive well-being				1.00	[0.76, 1.33]	.991			
Self-esteem				0.82	[0.65, 1.03]	.090			
Problem solving skills				0.92	[0.77, 1.11]	.383			
Personal control				1.19	[0.94, 1.51]	.155			
College beliefs				1.94	[1.55, 2.43]	.000			
Parent support							0.97	[0.76, 1.25]	.838
Parent-child relationship quality							1.46	[1.15, 1.86]	.002
Parent activities							1.16	[0.91, 1.48]	.230
Parent expectations for HS							1.33	[1.07, 1.65]	.010
Parent control							1.04	[0.82, 1.31]	.759
Pseudo- R^2 , Δ Pseudo- R^2		0.107			0.217, 0.110			0.183, 0.076	

Note. *OR* = odds ratio; CI = confidence interval.

Table 7 continued

Independent Variable	Model D (Friend)			Model E (Mesosystem)		
	<i>OR</i>	95% CI	<i>p</i>	<i>OR</i>	95% CI	<i>p</i>
Generation 1.5	1.07	[0.30, 3.81]	.917	1.08	[0.35, 3.33]	.890
Second generation	1.26	[0.45, 3.51]	.664	1.11	[0.43, 2.88]	.826
Third plus generation	1.15	[0.35, 3.75]	.818	1.15	[0.41, 3.22]	.785
Spanish in home	1.32	[0.72, 2.40]	.366	1.44	[0.81, 2.56]	.217
Lives with both biological parents	1.46	[0.92, 2.31]	.109	1.56	[1.03, 2.36]	.033
Male	0.85	[0.53, 1.35]	.487	0.86	[0.58, 1.27]	.453
Grade 8 at baseline	0.64	[0.30, 1.35]	.241	0.69	[0.36, 1.32]	.263
Grade 9 at baseline	1.44	[0.65, 3.23]	.370	1.33	[0.65, 2.72]	.436
Grade 10 at baseline	1.44	[0.66, 3.17]	.364	1.37	[0.67, 2.82]	.394
Grade 11 at baseline	2.73	[0.99, 7.56]	.053	2.44	[0.99, 5.98]	.052
Parental level of education	1.21	[0.91, 1.61]	.186	1.17	[0.93, 1.48]	.179
Family income	1.29	[1.00, 1.67]	.047	1.33	[1.05, 1.68]	.018
Friend support	1.07	[0.84, 1.37]	.579			
Friends' substance use	0.81	[0.62, 1.06]	.119			
Friends' connected to school	0.88	[0.63, 1.22]	.436			
Friends' college expectations	1.09	[0.74, 1.60]	.675			
Friends' GPA	1.76	[1.29, 2.41]	.000			
Parent-friend connectedness				1.17	[0.96, 1.44]	.126
Pseudo- R^2 , Δ Pseudo- R^2		0.214, 0.107			0.114, 0.007	

Note. *OR* = odds ratio; *CI* = confidence interval.

In model E, the mesosystem factor and controls were included in the analysis.

Parent-friend connectedness was not a significant predictor. The explained pseudo- R^2 was .114, which was similar to the control model, only .007 greater.

Final model. Table 8 shows the final hierarchical logistic regression models for high school graduation, which included only the controls (model A above) and significant predictors in each domain from the previous set of analysis (Table 7). This shows the additive effect of each layer of the social ecology and how the factors in each domain come together to predict the outcome. Building on the control model, the first model added the significant individual factor, college beliefs, to the model. College beliefs ($OR = 1.84, p < .001, 95\% CI [1.50, 2.27]$) significantly added to the model.

Table 8

Final Hierarchical Logistic Regressions Predicting High School Graduation

Independent Variable	Controls + Individual			+ Family			+ Friend		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Generation 1.5	1.15	[0.37, 3.65]	.808	1.27	[0.38, 4.25]	.694	1.18	[0.34, 4.08]	.791
Second generation	1.04	[0.39, 2.74]	.942	1.23	[0.45, 3.38]	.691	1.22	[0.44, 3.41]	.698
Third plus generation	1.11	[0.39, 3.14]	.847	1.33	[0.44, 3.97]	.613	1.12	[0.36, 3.51]	.847
Spanish in home	1.26	[0.70, 2.30]	.442	1.21	[0.67, 2.17]	.528	1.14	[0.63, 2.03]	.669
Lives with both biological parents	1.50	[0.95, 2.37]	.084	1.50	[0.95, 2.38]	.084	1.47	[0.91, 2.38]	.119
Male	0.88	[0.58, 1.35]	.568	0.87	[0.57, 1.34]	.535	0.85	[0.54, 1.34]	.491
Grade 8 at baseline	0.68	[0.34, 1.36]	.276	0.71	[0.33, 1.53]	.386	0.66	[0.30, 1.45]	.305
Grade 9 at baseline	1.57	[0.74, 3.34]	.235	1.65	[0.77, 3.53]	.197	1.64	[0.75, 3.59]	.212
Grade 10 at baseline	1.71	[0.80, 3.67]	.164	1.89	[0.88, 4.06]	.102	1.81	[0.84, 3.87]	.128
Grade 11 at baseline	2.94	[1.22, 7.08]	.016	3.15	[1.27, 7.79]	.013	3.15	[1.26, 7.86]	.014
Parental level of education	1.10	[0.86, 1.41]	.435	1.13	[0.87, 1.46]	.364	1.12	[0.84, 1.50]	.433
Family income	1.35	[1.07, 1.70]	.010	1.31	[1.05, 1.63]	.016	1.31	[1.04, 1.64]	.020
College beliefs	1.84	[1.50, 2.27]	.000	1.69	[1.37, 2.08]	.000	1.55	[1.24, 1.94]	.000
Parent-child relationship quality				1.40	[1.09, 1.79]	.009	1.36	[1.05, 1.77]	.019
Parent expectations for HS				1.20	[0.98, 1.48]	.074	1.26	[1.02, 1.55]	.031
Friends' GPA							1.64	[1.21, 2.22]	.001
Pseudo R^2 , Δ Pseudo R^2	0.202, 0.095			0.238, 0.036			0.291, 0.053		
Wald χ^2	33.369, $df = 1$, $p = .000$			5.890, $df = 2$, $p = .053$			10.149, $df = 1$, $p = .002$		

Note. OR = odds ratio; CI = confidence interval; Wald X^2 tests the overall improvement in fit over the previous model.

At this step, the pseudo- $R^2 = .202$ and Wald $\chi^2(1) = 33.369$, $p < .001$, indicating this model fit significantly better than the controls alone.

The second step included the controls, college beliefs, and added the two significant family factors: relationship quality and expectations to graduate from high school. Parent-child relationship quality proved to be significant at this step ($OR = 1.40$, $p = .009$, 95% CI [1.09, 1.79]) and parent expectations was marginally significant, $OR = 1.20$, $p = .074$, 95% CI [0.98, 1.48]. Pseudo- $R^2 = .238$, an improvement of .036 over the previous model. Wald $\chi^2(2) = 5.890$, $p = .053$, a marginal improvement.

Finally, the last step added friends' GPA as a predictor. Friends' GPA significantly predicted high school graduation ($OR = 1.64$, $p = .001$, 95% CI [1.21, 2.22]). This model had the greatest goodness of fit, pseudo- $R^2 = .291$, and the model provided significantly better fit than the previous model (Wald $\chi^2(1) = 10.149$, $p = .002$).

Predictors of College Graduation

College graduation was tested using the same series of analyses as high school graduation. Bivariate logistic regressions were first conducted for each factor and college graduation (see Tables 9 and 10). The significant bivariate estimates were living with both biological parents, parents' education level, positive well-being, self-esteem, college beliefs, parents' expectations for college graduation, friends' substance use, friends' college expectations, and friends' GPA. Parent-child relationship quality and parent-friend connectedness were marginally significant ($p < .10$).

Table 9

Bivariate Estimates between College Graduation and Categorical Variables

	Predicted probability of college graduation	<i>OR</i>	95% CI	<i>p</i>
Spanish not in home*	.15			
Spanish in home	.13	0.90	[0.54, 1.49]	.464
Doesn't live with both biological parents*	.09			
Lives with both biological parents	.18	2.13	[1.24, 3.66]	.006
Grade 7 at baseline*	.11			
Grade 8 at baseline	.12	1.10	[0.51, 2.41]	.807
Grade 9 at baseline	.16	1.52	[0.70, 3.31]	.293
Grade 10 at baseline	.17	1.58	[0.73, 3.45]	.248
Grade 11 at baseline	.13	1.23	[0.56, 2.72]	.608

Note. * = reference group for categorical variables; *OR* = odds ratio; CI = confidence interval.

Separate domain analyses. A series of logistic regression models tested the controls and each set of predictors (i.e., within each domain). In addition, a separate regression estimated the effects of a trimmed model that excluded the non-significant factors. Table 11 displays the results for each model. Model A included the controls as a comparative model. Living with both biological parents was the only significant factor, $OR = 2.18$, $p = .008$, 95% CI [1.22, 3.89] and $\text{pseudo-}R^2 = .112$.

In model B the individual factors were tested along with these control variables. College beliefs ($OR = 2.91$, $p < .001$, 95% CI [1.78, 4.75]) was the only significant individual predictor from this domain. The $\text{pseudo-}R^2 = .347$, which was an improvement of .235 over the control model. When the non-significant factors from the individual domain were removed (only college beliefs was included with the controls), the model fit was not significantly reduced compared to the previous model, with $\text{pseudo-}R^2 = .341$ and $\text{Wald } \chi^2(4) = 1.215$, $p = .876$.

Table 10

Bivariate Estimates between College Graduation and Continuous Variables

	Predicted probability of college graduation			<i>OR</i>	95% CI	<i>p</i>
	1 <i>SD</i>		1 <i>SD</i>			
	Below <i>M</i>	<i>M</i>	Above <i>M</i>			
Parental level of education	.10	.13	.18	1.40	[1.03, 1.89]	.031
Family income	.11	.14	.17	1.30	[0.79, 2.13]	.295
Positive well-being	.10	.13	.17	1.37	[1.05, 1.80]	.021
Self-esteem	.10	.13	.17	1.40	[1.05, 1.85]	.020
Problem solving skills	.12	.14	.16	1.16	[0.89, 1.51]	.264
Personal control	.14	.14	.14	1.02	[0.82, 1.27]	.848
College beliefs	.04	.10	.26	3.03	[1.86, 4.95]	.000
Parent support	.12	.14	.16	1.17	[0.87, 1.56]	.305
Parent-child relationship quality	.11	.14	.16	1.25	[0.97, 1.61]	.088
Parent activities	.13	.14	.15	1.10	[0.88, 1.37]	.407
Parent expectations for college	.08	.13	.20	1.66	[1.21, 2.26]	.001
Parent control	.16	.14	.12	0.87	[0.68, 1.11]	.266
Friend support	.14	.14	.14	0.98	[0.77, 1.23]	.841
Friends' substance use	.18	.13	.09	0.67	[0.51, 0.88]	.004
Friends' connected to school	.11	.13	.16	1.27	[0.90, 1.79]	.180
Friends' college expectations	.09	.13	.18	1.55	[1.08, 2.22]	.018
Friends' GPA	.08	.13	.19	1.60	[1.18, 2.17]	.002
Parent-friend connectedness	.11	.14	.17	1.27	[0.98, 1.64]	.076

Note. *OR* = odds ratio; CI = confidence interval.

The family factors were added to the controls in model C. Parent-child relationship quality ($OR = 1.36$, $p = .029$, 95% CI [1.03, 1.79]), and parents' expectations for college graduation ($OR = 1.61$, $p = .002$, 95% CI [1.17, 2.20]) both predicted college graduation. Pseudo- $R^2 = .198$, representing a .086 improvement over the control model. Exclusion of the non-significant effects from the family domain did not significantly worsen model fit, pseudo- $R^2 = .190$, Wald $\chi^2(3) = 0.775$, $p = .855$.

Table 11

Logistic Regressions Predicting College Graduation

Independent Variable	Model A (Controls)			Model B (Individual)			Model C (Family)		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Generation 1.5	0.89	[0.24, 3.25]	.860	0.78	[0.20, 3.02]	.720	0.96	[0.27, 3.50]	.954
Second generation	1.04	[0.34, 3.15]	.951	0.80	[0.25, 2.58]	.710	1.16	[0.37, 3.57]	.799
Third plus generation	1.27	[0.40, 4.05]	.691	0.95	[0.24, 3.75]	.938	1.31	[0.39, 4.46]	.664
Spanish in home	1.18	[0.56, 2.49]	.663	1.18	[0.51, 2.72]	.700	1.14	[0.52, 2.50]	.739
Lives with 2 biological parents	2.18	[1.22, 3.89]	.008	1.98	[1.09, 3.60]	.026	2.09	[1.15, 3.81]	.016
Male	0.76	[0.44, 1.32]	.326	0.78	[0.42, 1.46]	.436	0.76	[0.43, 1.33]	.332
Grade 8 at baseline	1.10	[0.49, 2.44]	.817	1.25	[0.52, 3.01]	.610	1.16	[0.52, 2.61]	.720
Grade 9 at baseline	1.77	[0.81, 3.85]	.153	2.33	[0.97, 5.62]	.059	1.67	[0.74, 3.76]	.215
Grade 10 at baseline	1.73	[0.79, 3.80]	.172	2.33	[0.98, 5.56]	.057	1.79	[0.80, 3.97]	.155
Grade 11 at baseline	1.34	[0.58, 3.09]	.493	1.76	[0.71, 4.35]	.224	1.45	[0.61, 3.43]	.396
Parental level of education	1.42	[0.94, 2.16]	.100	1.27	[0.81, 1.98]	.290	1.50	[0.96, 2.34]	.071
Family income	1.08	[0.72, 1.63]	.708	1.06	[0.72, 1.56]	.786	1.04	[0.70, 1.54]	.862
Positive well-being				1.08	[0.77, 1.51]	.672			
Self-esteem				1.10	[0.80, 1.53]	.552			
Problem solving skills				0.95	[0.71, 1.27]	.714			
Personal control				0.92	[0.70, 1.23]	.586			
College beliefs				2.91	[1.78, 4.75]	.000			
Parent support							0.96	[0.70, 1.32]	.809
Parent-child relationship quality							1.36	[1.03, 1.79]	.029
Parent activities							0.96	[0.74, 1.26]	.778
Parent expectations for college							1.61	[1.17, 2.20]	.002
Parent control							0.87	[0.65, 1.15]	.316
Pseudo R^2 , Δ Pseudo R^2		.112			.347, .235			.198, .086	

Note. OR = odds ratio; CI = confidence interval.

Table 11 continued

Independent Variable	Model D (Friend)			Model E (Mesosystem)		
	<i>OR</i>	95% CI	<i>p</i>	<i>OR</i>	95% CI	<i>p</i>
Generation 1.5	0.80	[0.21, 3.08]	.747	0.83	[0.22, 3.07]	.777
Second generation	1.10	[0.34, 3.61]	.876	0.92	[0.29, 2.92]	.891
Third plus generation	1.28	[0.36, 4.58]	.703	1.11	[0.33, 3.75]	.867
Spanish in home	1.10	[0.51, 2.37]	.807	1.18	[0.56, 2.51]	.659
Lives with both biological parents	1.96	[1.05, 3.66]	.034	2.16	[1.22, 3.85]	.009
Male	0.76	[0.41, 1.39]	.371	0.77	[0.44, 1.33]	.352
Grade 8 at baseline	1.24	[0.55, 2.81]	.599	1.10	[0.50, 2.44]	.816
Grade 9 at baseline	2.39	[1.02, 5.64]	.046	1.78	[0.82, 3.86]	.147
Grade 10 at baseline	2.58	[1.06, 6.29]	.037	1.73	[0.79, 3.81]	.171
Grade 11 at baseline	2.11	[0.83, 5.37]	.118	1.34	[0.58, 3.11]	.493
Parental level of education	1.40	[0.91, 2.13]	.126	1.39	[0.93, 2.08]	.112
Family income	1.04	[0.72, 1.53]	.819	1.08	[0.72, 1.61]	.716
Friend support	0.94	[0.73, 1.20]	.623			
Friends' substance use	0.65	[0.48, 0.89]	.008			
Friends' connected to school	1.16	[0.78, 1.72]	.468			
Friends' college expectations	1.33	[0.86, 2.05]	.198			
Friends' GPA	1.38	[0.99, 1.92]	.057			
Parent-friend connectedness				1.15	[0.87, 1.52]	.322
Pseudo R^2 , Δ Pseudo R^2		.235, .123			.120, .008	

Note. *OR* = odds ratio; CI = confidence interval.

Model C tested the friend variables plus the controls. Friends' substance use (*OR* = 0.65, *p* = .008, 95% CI [0.48, 0.89]) was the significant friend factor, but friends' GPA was marginally significant, *OR* = 1.38, *p* = .057, 95% CI [0.99, 1.92]. The pseudo- R^2 = .235, which was .123 greater than the control model. Exclusion of the non-significant effects in the friend domain did not significantly worsen model fit, pseudo- R^2 = .205, Wald $\chi^2(3) = 2.732$, *p* = .435.

The last model added parent-friend connectedness. This variable did not contribute to the model. The pseudo- R^2 = .120, .008 greater than the control model.

Final model. A final hierarchical logistic regression model was conducted which included only the significant factors from the trimmed domain models (Table 11). These results are displayed in Table 12.

Table 12

Final Hierarchical Logistic Regressions Predicting College Graduation

Independent Variable	Controls + Individual			+ Family			+ Friend		
	<i>OR</i>	95% CI	<i>p</i>	<i>OR</i>	95% CI	<i>p</i>	<i>OR</i>	95% CI	<i>p</i>
Generation 1.5	0.84	[0.22, 3.27]	.807	0.90	[0.23, 3.50]	.874	0.87	[0.21, 3.53]	.844
Second generation	0.84	[0.27, 2.66]	.770	0.91	[0.29, 2.89]	.876	1.05	[0.32, 3.42]	.939
Third plus generation	1.02	[0.28, 3.80]	.971	1.08	[0.29, 4.08]	.907	1.18	[0.30, 4.66]	.813
Spanish in home	1.12	[0.48, 2.62]	.792	1.09	[0.47, 2.51]	.844	1.05	[0.46, 2.37]	.910
Lives with both biological parents	2.01	[1.11, 3.64]	.022	1.94	[1.07, 3.52]	.029	1.77	[0.95, 3.29]	.074
Male	0.79	[0.42, 1.46]	.448	0.78	[0.42, 1.45]	.436	0.80	[0.43, 1.49]	.477
Grade 8 at baseline	1.22	[0.50, 2.96]	.664	1.26	[0.51, 3.16]	.615	1.31	[0.53, 3.23]	.556
Grade 9 at baseline	2.22	[0.95, 5.22]	.066	2.23	[0.94, 5.28]	.067	2.40	[1.02, 5.64]	.045
Grade 10 at baseline	2.26	[0.95, 5.39]	.067	2.34	[0.98, 5.59]	.054	2.73	[1.14, 6.53]	.024
Grade 11 at baseline	1.66	[0.68, 4.03]	.263	1.81	[0.75, 4.37]	.188	2.14	[0.88, 5.22]	.093
Parental level of education	1.28	[0.83, 1.95]	.263	1.32	[0.86, 2.02]	.202	1.35	[0.89, 2.06]	.160
Family income	1.06	[0.72, 1.57]	.753	1.05	[0.72, 1.53]	.817	1.03	[0.72, 1.46]	.892
College beliefs	2.97	[1.83, 4.84]	.000	2.71	[1.59, 4.62]	.000	2.48	[1.45, 4.24]	.001
Parent-child relationship quality				1.24	[0.93, 1.66]	.141	1.18	[0.88, 1.59]	.268
Parent expectations for college				1.22	[0.85, 1.75]	.286	1.21	[0.83, 1.74]	.318
Friends' substance use							0.66	[0.47, 0.94]	.019
Friends' GPA							1.35	[0.99, 1.86]	.060
Pseudo R^2 , Δ Pseudo R^2	.341, .229			.360, .019			.394, .034		
Wald χ^2	19.280, $df = 1$, $p = 0.000$			1.981, $df = 2$, $p = 0.360$			16.921, $df = 2$, $p = 0.002$		

Note. *OR* = odds ratio; *CI* = confidence interval; Wald X^2 tests the overall improvement in fit over the previous model.

In the first model, the college beliefs factor was added to the control model. College beliefs ($OR = 2.97, p < .01, 95\% \text{ CI } [1.83, 4.84]$) was a significant predictor. This model had a pseudo- $R^2 = .341$, which was a large .229 increase over the model that included the controls alone. The Wald $\chi^2(1) = 19.280, p < .001$, indicating this model fits significantly better than the controls alone.

Next, the two significant family factors, relationship quality and parents' expectations for college graduation, were added. These family variables were not statistically significant predictors of college graduation. The pseudo- $R^2 = .360$, an increase of .019. The Wald χ^2 was not significant, meaning the family factors do not contribute to the model once college beliefs is in the model.

In the final step, the two significant factors from the friend microsystem were added. Friends' substance use ($OR = 0.66, p = .019, 95\% \text{ CI } [0.47, 0.94]$) significantly predicted college graduation. This model had the greatest pseudo- R^2 (.394), which was an additional .034 from the previous model. This model had a significantly better fit compared to the previous model, Wald $\chi^2(2) = 16.921, p = .002$.

Post Hoc Analysis

College beliefs proved to be the strongest factor for both high school and college graduation. In bivariate analyses, college beliefs was significantly related to both outcomes and at one standard deviation above the mean, college beliefs was among the factors with the greatest predicted probability of high school graduation (.84) and college graduation (.26). College beliefs was also significant among the individual factors in the separate domain analyses and at every step of the final hierarchical models for both

outcomes. To understand more about the variables related to this key factor, an additional round of analyses were conducted.

Table 13

Multiple Linear Regression between College Beliefs and Other Predictors

	<i>B</i>	<i>SE</i>	95% CI	<i>p</i>
Intercept	-.14	.19	[-0.23, 0.51]	.453
Generation 1.5	.01	.18	[-0.35, 0.37]	.950
Second generation	.30	.14	[0.02, 0.57]	.032
Third plus generation	.24	.17	[-0.10, 0.58]	.163
Spanish in home	.10	.09	[-0.07, 0.26]	.256
Lives with both biological parents	.00	.08	[-0.15, 0.15]	.984
Male	-.13	.08	[-0.27, 0.02]	.099
Grade 8 at baseline	.05	.12	[-0.18, 0.29]	.670
Grade 9 at baseline	-.18	.11	[-0.40, 0.05]	.120
Grade 10 at baseline	-.20	.12	[-0.43, 0.03]	.083
Grade 11 at baseline	-.08	.12	[-0.32, 0.16]	.516
Positive well-being	.10	.05	[0.01, 0.19]	.022
Self-esteem	.14	.05	[0.06, 0.23]	.002
Problem solving skills	.11	.03	[0.04, 0.17]	.002
Personal control	.02	.05	[-0.07, 0.11]	.603
Parent support	-.02	.06	[-0.13, 0.09]	.706
Parent-child relationship quality	.04	.03	[-0.03, 0.10]	.244
Parent activities	.04	.04	[-0.04, 0.12]	.322
Parent expectations for college	.35	.06	[0.23, 0.47]	.000
Parent expectations for high school	.02	.05	[-0.07, 0.10]	.731
Parent control	.00	.03	[-0.07, 0.07]	.997
Friends' substance use	.01	.04	[-0.07, 0.09]	.730
Friends' connected to school	.01	.07	[-0.12, 0.14]	.924
Friends' college expectations	.06	.07	[-0.07, 0.19]	.358
Friends' GPA	.15	.06	[0.03, 0.27]	.014
Friend support	.01	.04	[-0.07, 0.09]	.817
Parent-friend connectedness	.04	.04	[-0.04, 0.12]	.326
$R^2 = .332$				

Post hoc multiple linear regressions were conducted to determine the variables that were significant predictors of college beliefs (Table 13). Greater college beliefs were

related to second generation (as compared to first), higher positive well-being, greater self-esteem, higher problem solving, higher parents' expectations for college graduation, and higher friends' GPA. The predictors explained 33.2% of the variance in college beliefs.

CHAPTER 4: DISCUSSION

Mexican students represent a large percentage of students at American schools and there is considerable need to understand educational outcomes and how the related processes are both unique and similar. Though Mexicans face many challenges, it is important to not focus exclusively on the barriers or negative outcomes. The PYD approach stresses the benefits of concentrating on how young people make a positive contribution to the community and understanding the processes associated with thriving (Lerner et al., 2006). Studying the factors related to high school and college graduation can provide information to enable programs and policies to better serve this large segment of the American population. By studying individual-level variables grounded in developmental asset theory, alongside microsystem and mesosystem factors based on the ecodevelopmental framework, we gain a more complete picture of the processes associated with these outcomes. As a nationally representative sample, these results provide insights that are relevant to the whole country.

This study had the advantage of measuring predictors in junior high and high school and then measuring educational outcomes several years later. The developmental perspective is one of the three general principles of the ecodevelopmental theory. Measuring predictors and outcomes at different points in time provides greater information about the processes involved compared to just looking at a single snapshot of development (Szapocznik & Coatsworth, 1999). PYD and resilience frameworks also

emphasize the importance of processes associated with outcomes, not simply which factors are related at a given time (Lerner et al., 2006; Masten, 2001).

The rate of high school graduation for this study was 73%, which is much higher than some rates found for Latinos or Mexicans in previous studies. Swanson (2004) reported the national graduation rate for Hispanics to be 54%, and in 2004 the US Census estimated 52.4% of Mexicans over age 25 had a high school diploma or more (US Census Bureau, 2007a). One reason the numbers appear to vary is because there are many different ways to calculate these numbers: four-year high school graduation, non-completion, formal dropping out rates, young people who stop attending high school, and number of young adults who possess a high school diploma (Barton, 2009; Schargel, 2004a). Therefore, rather than comparing statistics, the results of this study should be understood to represent exactly the population that was sampled.

There may be reasons that explain these discrepancies. Research suggests that ninth or tenth grade is when most dropouts leave high school (Englund et al., 2008; Ream & Rumberger, 2008; Stearns & Glennie, 2006). Ninth grade marks the transition to high school and this is when many students begin to fall behind, fail to be promoted to tenth grade, and then are at greater risk of dropping out (Neild, 2009). This study included Wave I adolescents in tenth and eleventh grade who may have been more likely to graduate. The predicted probability of high school graduation varied from .64 among eighth graders to .84 among eleventh graders, and though the numbers were not statistically significant they do appear to vary. These differences were adjusted for in all subsequent models by controlling for grade level at the Wave I survey. Additionally, young people who would have been in tenth or eleventh grade and had already dropped

out before the sampling began were not included in this study. Graduation statistics sometimes have included immigrants who came to the US as older adolescents or young adults (many who may not have graduated from high school prior to immigrating and who never attended school in the US) (Barton, 2009). Therefore, the high school graduation results in this study are best interpreted with a strict understanding of the operational definition of high school graduation; that is, the percentage of seventh through eleventh graders who as young adults (during Wave IV) reported that they had completed high school. Though this measure of high school graduation might not be equivalent to other measures, it is still very useful as a measure of resilience, as seen in subsequent analyses of the prediction models. The goal of this study was to understand the processes related to resilience and positive educational outcomes, and this measure of high school graduation is very useful and serves this purpose well.

The results for college graduation were around 14%, which was slightly higher but still quite similar to the findings from other research. College graduation rates are much less disputed than estimates for high school graduation or dropout, and generally participants are simply asked whether they have completed a bachelor's degree (e.g., Sciarra & Whitson, 2007), which matches the method in Add Health. Rumbaut (2008) reported that among Hispanics 25 and older, those with a bachelor's degree ranged from 5.6% to 11.3% and 1.6% to 3.3% had an advanced degree (depending on immigrant generation). Like high school graduation, the results found in this study could be higher because the sample was from American junior high and high schools and did not include immigrants who came to the US later in adolescence or adulthood.

This study confirms previous research that Mexicans have low rates of postsecondary educational attainment, especially give that this study only included American high school students and no later immigrants. Compared to others, Hispanics have lower education levels than other non-immigrant ethnic groups (between 13.9% to 34.6% have a bachelor's degree and 3.7% to 15.8% have an advanced degree) (Rumbaut, 2008). The lower numbers of Latino college graduates is related to fewer Latino high school graduates going to college, more attending two-year colleges, and more attending college only part-time—all factors related to lower college graduation rates (Sciarra & Whitson, 2007). Though 73% of Mexicans graduated from high school in this study, only 14% completed a bachelor's degree, showing there are many missed opportunities (Figure 4).

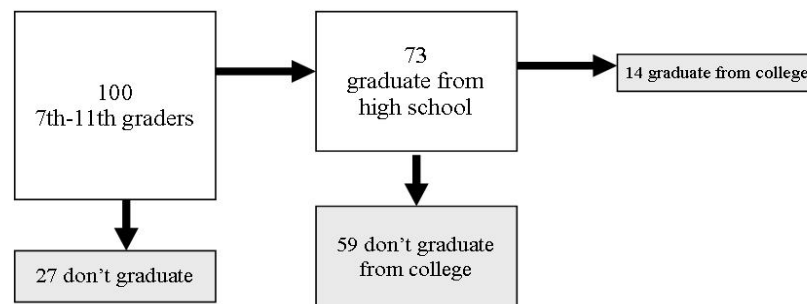


Figure 4. A leaky education pipeline. The education system (arrows pointing right) loses most Mexican students before and after high school graduation (arrows pointing down), and by college graduation only 14 out of 100 students remain.

Gender results

This study provides clear, nationally representative data about gender and Mexicans' high school and college graduation. Previous research shows contradictions—some have concluded Mexican boys had greater education, and some have found that

girls achieved more. The results of this study found no significant differences between boys and girls for high school or college graduation. In contrast to one previous finding in which 48% of Latino boys and 58.8% of Latinas graduated from high school (Swanson, 2004), this study found 72% of boys and 75% of girls graduated from high school and 12% of boys and 15% of girls graduated from college.

Research and theory about Latinos and gender differences find varying reasons to expect boys and girls to excel in school or drop out. There are statistics that *both* Latinos and Latinas have higher graduation rates, higher drop out rates, and are more likely to finish college (Garcia & Bayer, 2005; Grant & Rong, 1999; Hernandez et al., 1994; Sciarra & Whitson, 2007; Swanson, 2004). Though this study found no gender differences, it is still possible that there are different processes for boys and girls to graduate or drop out but that these processes lead to the same results. Latino families might require daughters to put their family's material needs first, having them drop out and work full-time; or families give their sons' education priority over daughters (Calderon, 1998; Garcia & Bayer, 2005; Grant & Rong, 1999). Daughters might also follow traditional values of caretaking, submissiveness, and dependence which might hinder their personal educational goals (Zambrana & Zoppi, 2002). Boys might benefit from greater support for their education (Calderon, 1998), but some researchers suggest boys are more likely to subscribe to an anti-school attitude, resisting the "school boy" label or being ridiculed for "acting white" (Grant & Rong, 1999). But some suggest that Latino immigrant communities in the US actually see the benefit in women's education and strongly support their daughters in ways that might not have been possible in their

countries of origin (Grant & Rong, 1999), so perhaps this means there are truly fewer differences in boys' and girls' graduation.

Immigrant generation results

Statistical differences in immigrant generation and educational outcomes were not significant. This contradicts previous research that found first generation (including 1.5 generation) immigrants had lower education levels compared to second and/or third generation immigrants (Grant & Rong, 1999; Rumbaut, 2008; Wojtkiewicz & Donato, 1995). This study, however, found similar percentages in each generation graduating from high school (71-74%) and college (10-16%). One reason for this difference is that often studies have included first generation immigrants who came to the US after high school and never attended American schools (Barton, 2009; i.e., Grant & Rong, 1999 & Rumbaut, 2008). Add Health recruited directly from schools, resulting in a very different sample. This is important because these statistics that include non-students can misinform school interventions that treat immigrant generation as a risk factor for dropping out or failing to graduate from high school. The findings of this study are an accurate reflection of American high schools in the 1990's and the results do not reflect community education levels.

Predicting high school and college graduation

Table 14 shows the significant factors from the logistic regression analyses for both high school and college graduation. Though there were only a few significant factors, the final model for high school graduation (Table 8, model in last column, $\text{pseudo-}R^2 = .291$) and college graduation (Table 12, model in last column, $\text{pseudo-}R^2 = .349$) were reasonably strong. Along with some key demographic or background

variables, college beliefs, parents' expectations for graduation, and friends' GPA provide a good picture of high school and college graduation for Mexicans in the US. In addition, friend's substance use is a salient predictor of college graduation. Because there were significant individual and microsystem factors, the ecodevelopmental framework and developmental assets proved to be a very good theoretical foundation for understanding the educational outcomes in this study. Researchers advocate an integrative model of intrapersonal and ecological factors (Schwartz et al., 2007), and this study supports such an approach. It is possible that intrapersonal and ecological processes are *reciprocal* and interact to effect outcomes, but some researchers argue that it is more likely that family and friends influence outcomes *through* intrapersonal development (Schwartz et al., 2007). The hierarchical regressions found that adding the individual domain and the friend domain of the ecosystem did significantly improve the model. However, the addition of the family domain marginally improved the model for high school graduation and did not improve the model for college graduation. Because the individual factor was stronger, this might mean the family factors are mediated by college beliefs. With so many possible factors associated with youth outcomes, this organization of key factors

Table 14

Summary of Significant Regression Factors

High school graduation	College graduation
College beliefs	College beliefs
Parent-child relationship quality	Parent-child relationship quality
Parent expectations for HS	Parent expectations for college
Friends' GPA	Friends' GPA
	Friends' substance use

facilitated analyses and interpretation. But future work should examine this mediation hypothesis.

The following sections will expand on the individual factor that was significant, college beliefs, and the significant family and friend microsystem factors.

Individual factor: College beliefs. The analysis of educational outcomes began with individual factors. College beliefs correspond to the developmental asset of positive view of the future (Catalano et al., 2004). College beliefs was the only individual factor that was significant in predicting these educational outcomes, however it was the strongest and most consistent significant factor overall. This measure was a combination of aspirations and expectations for going to college. Previous research also has found the strong predicting power of aspirations and expectations. For example, South and colleagues (2003) found educational aspirations were negatively related to dropping out of high school in a sample of American young people. Expectations have also been linked to getting good grades (Caldwell et al., 2006; Waxman et al., 2007). Because the current study found college beliefs to be the most important factor in understanding graduation (as opposed to not dropping out or grades), this provides additional evidence of the importance of aspirations and expectations.

Aspirations and expectations about college appear to be a strong motivator for the Mexican students in this study and clearly had an important impact on outcomes. The current study contributes to a growing literature about positive outcomes for Latinos that often find they believe in the importance of education and have an optimistic, long-term outlook. Looking at an interview with a Latino ninth grader in a different study provides an ideal example: “The most important hope for me is to finish high school so I could

become a dentist. I'm getting a lot of knowledge of science in biology and medicine too. I have to finish high school, then college, then medical school" (Yowell, 2002, p. 69). Many researchers have found that Mexican children and adolescents have dreams of important careers, well-paying jobs, and they understand that a college education is the key (Cooper, Brown et al., 2005; Hernandez et al., 1994; Yowell, 2002). Another longitudinal study also found college expectations to predict high school graduation (Ou & Reynolds, 2008). This study confirms the power of aspiring and expecting to go to college to produce results.

The post-hoc analysis showed several factors were significantly related to higher college beliefs: second generation (as opposed to first generation), positive well-being, self-esteem, problem solving, parents' expectations for college graduation, and friends' GPA. Carranza, You, Chhuon, and Hudley (2009) also studied Mexican high school students and they found higher expectations were related to self-esteem and parents' expectations (though more broadly defined in this study). It is not surprising that individual factors like these are linked. Factor analysis has found individual assets similar to college beliefs, positive well-being, self-esteem, and problem solving are conceptually and statistically related to each other (Theokas et al., 2005). Young people who want to go to college and believe they will graduate likely possess a number of individual strengths. The developmental asset theory maintains that individuals who possess many assets are more likely to display positive outcomes (Edwards, Mumford, Shillingford, et al., 2007), and because college beliefs was such a strong asset in this study, this could be why other factors were closely related.

For the family microsystem, higher college beliefs were predicted by higher parent expectations to complete college. Auerbach (2007) found providing moral support and encouragement for their children in a college-preparatory program was common among working-class Latino parents. Many parents believed their role was to repeatedly tell their children about the importance of education and encourage them to go to college. Reese and colleagues (2000) also found a link between parent and adolescent values and agency regarding school performance. Separate domain analysis found relationship quality and expectations significant. However, in the final hierarchical models, college beliefs eclipsed the family microsystem, which did not significantly improve the model fit for college graduation and only marginally improved the model for high school graduation. It is possible that having a positive parent-child relationship might help translate to outcomes through the development of students' aspirations and expectations regarding college. Family microsystems have been hypothesized to impact outcomes through the influence of individual factors (Schwartz et al., 2007). Mexican students who have a good relationship with their parents are more likely to develop those beliefs about college and then graduate from high school and college. Again, this points to the potential mediating mechanism of parent factors for individual assets/protective factors.

Having friends who get good grades was also related to college beliefs in the post hoc regression. Adolescents who were school-oriented tended to have friendship networks with similar educational values, and this study and others confirm that these friendship circles do have an influence on beliefs about college (Ream & Rumberger, 2008). It might also be that having friends who do well in school contributes to aspirations and expectations about college—the direction of the relationship is not clearly

defined. Again, as some researchers believe, it could be that the friend microsystem is related to the outcomes via the influence of intraindividual assets (Schwartz et al., 2007). Because friends' GPA was also related to the educational outcomes, it is possible that college beliefs could be a mediating factor between friends and graduation. This study provides some insight into the process associated with educational outcomes, showing directions for future investigations.

Microsystem factors. The family and friend microsystems each included two factors that were significantly associated with the two outcomes. It was expected that this study would confirm the important role of family in educational outcomes of Mexicans (see Table 14). Family is of great importance to Mexicans and other Latinos and has proven to be a central influence in the lives of young people from all ethnic groups and backgrounds (Szapocznik & Coatsworth, 1999). Measurement of the family microsystem in this study included responses from both the adolescents and their parents, which is one of this study's strengths. Having a strong parent-child relationship and expecting children to graduate from high school and college were the factors that emerged as significant predictors in this study's separate domain analyses. Hierarchical regressions of high school graduation found the family microsystem marginally significant and it did not significantly contribute to model fit for college graduation after adjusting for the controls and other salient domain variables.

This study confirms the importance of family emotional support that has been found by previous researchers. Latino parents' beliefs in the importance of emotional support and giving advice likely influences the role they construct in their children's education, and then dictates how involved they are (Hoover-Dempsey et al., 2005). A

longitudinal study found positive relationships with parents helped keep children on the path to doing well academically (Englund et al., 2008). A great deal of past research about Latino families has found emotional support and encouragement were important in producing positive educational outcomes (Auerbach, 2007; Reese et al., 2000). Hurtado-Ortiz and Gauvin (2007) also found that parents' expectations to earn a college degree significantly predicted whether Mexican adolescents would go to college. This study confirms that parent-child relationship quality and parents' expectations about education are important and do contribute to their children's graduation success, though the college beliefs proved to be a stronger factor. However, as noted earlier, these family factors positively influence college beliefs.

Friends are another important part of understanding high school and college graduation (see Table 14). The friend microsystem included data from both the participant and from people who they named as their friends. The participants' friends' GPA was significant for both outcomes and friends' substance use was a significant predictor of college graduation in the separate domain analyses. In the hierarchical models, friends' GPA was significant for high school graduation and substance use was significant for college graduation. This mirrors the results of a nationally representative longitudinal study that found having friends with favorable academic behaviors was related to higher high school graduation rates and higher probability of going to college (South et al., 2003). Mounts and Steinberg (1995) also found high school students' GPA was related to their friends' GPAs and drug use.

Latino parents worry about the influence of *malas companias* (bad company) in detouring children from the "good path," which includes doing well in school and

completing their education; students themselves also cited bad friends as a challenge to accomplishing their educational goals (Cooper, Brown et al., 2005). The results of this study confirm that there is some reason to worry because having friends who use alcohol, cigarettes, and marijuana was negatively related to graduating from college.

Mesosystem factor. This study of Mexicans' educational outcomes was somewhat unique in examining the effect of the mesosystem beyond the influence of microsystems. While some studies have included similar measures of how well parents know their children's friends, the conceptualization of this measure as a mesosystem is distinctive. Though parent-friend connectedness was not significant in the model analysis, it bordered significance in the high school graduation bivariate analysis (Table 6) and was correlated with college beliefs (Appendix B).

Limitations

One strength of this study is the valuable information about a specific group of American adolescents. However, the results about Mexican youth cannot necessarily be generalized to other ethnicities or Latinos of all countries of origin. There are important demographic differences among Americans from different backgrounds and other Latin countries (Rumbaut, 2008) and this might impact educational outcomes and associated process. There might be reasons to use this study to support some hypotheses for other ethnic groups, but differences and similarities should be explored empirically.

Any secondary analysis is limited to the method and measures of the original study, as well as the problems associated with data collection and sampling. For example, not all participants answered questions about siblings, so this was not included in the analysis. As a component of the family microsystem, siblings are a possible influence for

those participants who have siblings. The friend factors that accessed data from the participants' friend network also involved a high percentage of missing data.

This study only included one measure of the family-friend mesosystem, which might have limited the ability to detect a significant effect. Stronger mesosystems are related to more positive outcomes (Coatsworth et al., 2000). Additional measures of the mesosystem would have more accurately assessed the strength of the link between family and friends. One variable that ideally would have been included is parents' influence over friendships. In one longitudinal study, Latino students who graduated had parents who were more likely to discourage friendships with peers who did not care about school (Romo & Falbo, 1996). The measure used in this study assessed how well parents knew their children's friends and their parents, but it is not specified if they might have approved of or disapproved of the friends or had any influence.

Though this sample is nationally representative, the relative number of Mexicans was not large, which limits the power of the statistics that can be performed. Wave I participants who were in tenth and eleventh grade were included to increase the sample size and this might have impacted some results that did not control for grade level, like the overall high school graduation probability. There were also fewer first generation and 1.5 generation immigrants, which might have impacted the ability to detect significant differences in the bivariate tests.

The findings from this study are very useful and generalizable to American schools, with the understanding that the sample included Mexicans in grades 7-11. The high school graduation rates cannot be generalized to Mexican communities that include

large numbers of immigrants who moved to the US in late adolescence or later and who have not attended schools here.

Implications of Findings

Despite the limitations, this study contributes to the literature and may offer important implications for prevention. This study shows that educational outcomes like high school and college graduation are influenced by experiences much earlier. Factors measured in junior high and early high school predicted whether students would graduate from high school and complete college years later. However, because there were only a few significant factors in this study, it is likely that there are many individual assets and experiences at school, with family, community, and friends that occur later in high school and college that are likewise important predictors of educational outcomes.

College beliefs was an important factor in this study, but other research has found that Latinos often do not have highest level of expectations and aspirations. One study concluded that Hispanics had lower educational expectations compared to other ethnic groups (Tashakkori et al., 1999), and among Latinos, Mexicans had the lowest expectations and aspirations (Bohon et al., 2006). Educational expectations have also been found to be positively correlated with SES and change very little over time (Anders, Adamuti-Trache, Yoon, Pidgeon, & Thompsen, 2007), perhaps this influences Latinos' lower graduation rates. Many Hispanic high school students are tracked into non-college-preparatory courses (Romo & Falbo, 1996), which might also limit the development of their college expectations and aspirations because they do not see college as a likely option for the future.

Changing the beliefs about college is not easy (Anders et al., 2007), but it should be included in intervention efforts and emphasized across settings. Interventions designed to be culturally sensitive to Latino students and families have had positive impacts on high school graduation and college attendance. Mitra (2006) found that empowering Latino students to be the bridge between parents and schools was more successful than the school's efforts to get parents more involved and the result was a positive change in school atmosphere and programs. The Latino students reported they were more capable of understanding both the US school system and their families' customs and values. Nesman, Batsche, and Hernandez (2007) used a cultural-ecological approach for their school intervention to increase graduation rates that was carefully designed with community input to ensure the needs, barriers, and values of the Latino students and families were incorporated. The intervention included many levels: family involvement, community outreach, scholarships, and student leadership development. The results showed increased percentages of Latinos in twelfth grade and at the local university and increased numbers in community college (though of course many factors affect enrollment, not solely the intervention). Presumably interventions like these would increase both aspirations and expectations about college.

While there were several important predictors related to college graduation, many more young people did not finish college than did. The current study found that only 12% of boys and 15% of girls graduated from college, which is similar to other results of college graduation among Mexican youth. Substantial efforts are needed to help more Mexican young people find a path to college graduation by developing their aspirations and expectations, helping their parents to be supportive and to have expectations for their

children to go to college, and encouraging students to be involved with high performing peer groups. Interventions should begin in junior high and in early high school to develop these beliefs and supports. Past interventions with Latino students successfully contributed to better student and parent involvement in programs, and increased college enrollment (Mitra, 2006; Nesman et al., 2007).

The results highlight the important role of family. Current research has found that Latino parents have difficulty providing instrumental help with schoolwork (Auerbach, 2007; Romo & Falbo, 1996), but a more global measure of parent-child relationship quality was an important factor in this study. Another significant factor was having parents who expect their children to complete their education, and this can be incorporated into intervention efforts. Some efforts to include parents have been more effective than others, such as encouraging students to take on leadership roles and using students to connect their parents to school (Mitra, 2006). School programs designed specifically for Latino communities have effectively used mentors to bridge the gap between parents and schools to help students prepare for graduation and college, but Latinos are more likely to attend poor schools with under-qualified teachers so such programs need to be extended (Cooper, Brown, et al., 2005; Waxman et al., 2007).

The ecodevelopmental framework used in this study emphasizes the importance of considering many different levels of factors that influence development. When many different relationships and aspects of the environment are considered, there are more opportunities to have a positive impact on youth development (Prado et al., 2008; Waxman et al., 2007). Programs designed to increase the number of developmental assets children have has also been effective in improving school performance and increasing

indicators of thriving (discussed earlier) (Benson, 2003; Mannes et al., 2005). This study provides additional evidence that promoting the growth of certain factors like college beliefs, encouraging parents to have school expectations, and helping students connect with others who care about school may be effective in improve long-term graduation outcomes for Mexicans.

Future Directions

Similar work utilizing the ecodevelopmental framework and educational outcomes should be done with samples of other groups of Latinos. There are economic, cultural, historical, and other factors that differentiate Mexicans from Cubans, Puerto Ricans, and other Latinos. These differences might (or might not) translate into different outcomes and processes related to high school and college graduation. Latino groups with smaller numbers are frequently grouped together (e.g., “Central American,” “South American,” or “other Latino) and this practice should be confirmed acceptable or abandoned. There are benefits and drawbacks to research that compares ethnic groups, so building a body of research that both compares groups and that focuses exclusively on only one group is important (Phinney & Landin, 1998).

Future research should examine a more comprehensive model of educational outcomes that includes other microsystems and mesosystems. The ecodevelopmental model includes school, neighborhood, and community microsystems, which should be considered in conjunction with family and friend microsystems (Szapocznik & Coatsworth, 1999). The strength of the links between these microsystems, the mesosystems, would also provide important information about outcomes. The school microsystem is one important level that deserves future attention because of the obvious

relationship with educational outcomes (Pantin et al., 2003). School climate, teacher-student connections, and school bonding are all factors that help or hinder the development of academic abilities and outcomes (Garcia-Reid et al., 2005; Waxman et al., 2007). Relationships with adults other than parents are also related to more positive outcomes for Latinos (DuBois & Silverthorn, 2005; Reese et al., 2000; Sanchez, Esparza, & Colon, 2008). These additional influences would provide additional information about the processes associated with educational outcomes.

Future research should also explore the processes involved with the development of individual and microsystem factors. The significant regressions between college beliefs and the other predictors (positive well-being, self-esteem, problem solving, parents' expectations for college graduation, and friends' GPA) hint at the complex process associated with outcomes. For example, it is not clear if college beliefs develop as a result of other factors or if the factors develop simultaneously. There is more to understand about how the individual factors are related. Those who graduate from high school and college and have high college beliefs might have those aspirations and expectations because of their relationships with family and friends. On the other hand, individuals with particular individual characteristics might elicit support from the people in their lives. There is likely a complex bidirectional relationship between factors, and understanding more about the processes will contribute to more effective interventions.

Because this study found predictors measured in junior high and high school were significant in predicting educational outcomes years later, it is likely that experiences and relationships in elementary school are also important. Individual factors like aspirations

and expectations likely begin to develop and gain strength throughout childhood. It is also possible that family experiences precede the development of college beliefs.

Given the small sample size, examining the interactions between factors was limited. There were no differences between boys and girls and immigrant generation differences in outcomes. Though this study found no outcome differences, it is possible there are different pathways and the key factors associated with outcomes could differ. Therefore, more work should examine possible gender or immigrant generation differences in the processes related to educational outcomes.

This study included only a handful of individual factors but there are many other individual factors included in the 40 developmental assets identified by researchers (Leffert et al., 1998; Search Institute, 2009). As a secondary analysis, this study was limited to the variables available in the Add Health data. The relationship between additional individual factors and microsystems would be a valuable contribution.

The factors associated with resilience and positive youth development are complex and this study only provides some insight into the issues. Future research should continue to utilize an ecodevelopmental model that accounts for many different levels of influence and considers cultural differences in the definition factors and outcomes. Integrating individual factors, such as those found in the developmental assets framework, provides essential information about the process associated with outcomes. High school graduation and a college education are important components of success for individuals in the US and for our communities and country as a whole (e.g., Bailey, 2005; Levin, 2005).

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APPENDIX A: Percentage of Missing Cases by Variable

Factor	Percentage missing
Immigrant generation	1.03
Income	33.70
Mean of parents' education	19.30
Sex	0.00
Lives with biological parents	0.00
Spanish	0.00
Grade	0.00
High school graduation	15.80
College graduation	24.00
Positive well-being	0.24
Self-esteem	0.32
Problem solving	0.24
Personal control	0.32
College beliefs	0.64
Parental support	1.75
Parental control	2.15
Parent-child relationship quality	18.90
Shared activities	1.83
Parents college expectations	1.99
Parents high school expectations	1.83
Friend support	5.01
Substance-using peers	2.39
Friends' school connect	57.00
Friends' GPA	55.80
Friends' college expectations	56.60
Parent-friend connected	21.10

APPENDIX B: Correlations among Predictors

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Well-being																
2. Self-esteem	.426**															
3. Personal control	.051	.250**														
4. Problem solving	.097*	.292**	.279**													
5. College beliefs	.244**	.310**	.132*	.223**												
6. Parent support	.219**	.423**	.148**	.216**	.188**											
7. Relationship quality	.080	.225**	.166**	.150**	.144**	.308**										
8. Shared activities	.169**	.150**	.027	.135*	.190**	.304**	.146**									
9. Parent control	-.033	-.012	-.036	.020	.014	.036	-.051	.046								
10. Parent college expectations	.077	.140**	.033	.114*	.429**	.122**	.054	.101*	.070*							
11. Parent HS expectations	.182**	.105**	.050	.034	.270**	.105	.065	.120*	-.013	.596**						
12. Friend support	.016	-.036	.024	-.037	.018	.003	-.018*	.108*	-.127**	.007	.056					
13. Friends' substance use	-.113*	-.144**	-.027	-.040	-.092	-.152**	-.157**	-.031	-.123**	-.109*	-.030	.172**				
14. Friends' GPA	.147*	.112*	.115	.047	.242**	.059	.087	.151*	-.003	.050	-.003	-.020	-.090			
15. Friends' school connected	.002	.132**	.084	-.015	.118	.045	.028	.106*	-.055	.068	-.055	.004	-.120	.203**		

Appendix B continued

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
16. Friends' college expectations	.132*	.133*	.080	.021	.190**	.126**	.088	.086	.013	.069	.013	-.021	-.119*	.325**	.264**	
17. Parent-Friend connected	.099*	.097*	.098	.011	.144**	.128**	.106*	.145**	.077	.035	.077	.215**	.068	.086	.114	.137*

Note. * $p < .05$; ** $p < .01$.